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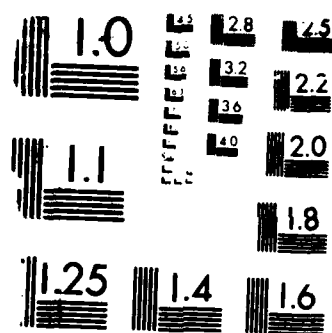
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A RAND NOTE

ALEC: A Model for Analyzing the Cost-Effectiveness
of Air Force Enlisted Personnel Policies
(Documentation and User's Guide)

C. Peter Rydell

August 1987

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The Aggregate Lifecycle Effectiveness and Cost (ALEC) model enables managers of Air Force enlisted personnel to compare the cost effectiveness of alternative management actions for a part of the force selected for analysis. Example actions are limits on the numbers of various types of enlistments, reenlistment bonuses designed to increase the number of persons making the Air Force a career, retraining programs that transfer personnel from one specialty to another, and the early-release program. This volume presents the microcomputer model that estimates the cost effectiveness of management actions for a given part of the enlisted force. Model users can evaluate complex combinations of actions and examine specific parts of the enlisted force. (See also N-2629/1.)

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Prepared for
The United States Air Force

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PREFACE

This work is part of the Enlisted Force Management Project (EFMP), which falls within the Resource Management Program of Project AIR FORCE. The EFMP is a joint project of RAND and members of the Air Force personnel community. For an overview of the EFMP see Grace M. Carter, Jan M. Chaiken, Michael P. Murray, and Warren E. Walker, *Conceptual Design of an Enlisted Force Management System for the Air Force*, The RAND Corporation, N-2005-AF, August 1983.

The EFMP is building a decision support system, called the Enlisted Force Management System (EFMS), to assist managers of the enlisted force in meeting force targets. This system will include computer models that project the force resulting from given management actions so actions that meet targets can be found, and computer models that estimate the costs of alternative management actions so efficient ways of meeting the targets can be found.

The Aggregate Lifecycle Effectiveness and Cost (ALEC) model focuses on the costing part of the EFMS's job. It analyzes the lifecycle of enlisted personnel, from the time a cohort enters the Air Force until the last of the cohort leaves the Air Force. The analysis tracks both the costs and the number of persons working during each year of the lifecycle and constructs ratios of cost to effectiveness to evaluate alternative management actions.

The model enables managers of Air Force enlisted personnel to compare the cost effectiveness of alternative management actions for a part of the force selected for analysis. Example actions that the model can evaluate are limits on the number of enlistments of various types, reenlistment bonuses designed to increase the number of persons who make the Air Force a career, retraining programs that transfer personnel from one specialty to another, and early releases of persons before the end of their obligated term of enlistment.

Often a variety of actions (or combinations of actions) are available to achieve a particular force management objective. Because ALEC is a microcomputer model that is easy to operate and that focuses

on a (user-selected) part of the enlisted force, the model enables enlisted force managers to quickly reduce a set of alternatives to a short list containing those that are most cost effective in a given situation.

The analysis is presented in two volumes, the first explains the theory behind the model and the second documents the model itself.

Volume 1, *ALEC: A Model for Analyzing the Cost-Effectiveness of Air Force Enlisted Personnel Policies (Theory and Results)*, N-2629/1-AF, gives the theory and behavioral relationships used to build the model and reports the results of using the model to compare the cost effectiveness of management actions for highly aggregated parts of the force.

Volume 2, *ALEC: A Model for Analyzing the Cost-Effectiveness of Air Force Enlisted Personnel Policies (Documentation and User's Guide)*, N-2629/2-AF, presents the microcomputer model that estimates the cost effectiveness of management actions for a given part of the enlisted force. Users of the model can evaluate more complex combinations of actions and examine more specific parts of the enlisted force than possible in Vol. 1.

A microcomputer disk may be included with Vol. 2 on request. The disk contains the ALEC model and the ALEC database (which currently reflects the Air Force specialty structure as of the end of fiscal year 1984). In addition to that microcomputer disk, operating the ALEC model requires a microcomputer installation that has an IBM PC compatible computer, with 640 K memory, a graphics card, a printer, and the Symphony spreadsheet program from the Lotus Development Corporation.

SUMMARY

The Aggregate Lifecycle Effectiveness and Cost (ALEC) model estimates the cost effectiveness of alternative management actions that the Air Force uses to control its enlisted force of approximately half a million persons. Specifically, the model estimates the ratio of incremental cost caused by the action to the incremental effectiveness caused by the planned actions. Both the cost and effectiveness components of this ratio are the net present values over the lifecycle of the cohort affected by the actions.

In the case of a plan that increases force size, the cost effectiveness ratio indicates cost per unit of effectiveness added (so, smaller ratios are better). In the case of a plan that decreases force size, the cost effectiveness ratio indicates the savings obtained per unit of effectiveness lost (so larger ratios are better).

Users of the model choose which part of the enlisted force to analyze and which combinations of management actions to test. The database supplied with the model enables users to analyze parts of the enlisted force at the level of the first three digits of the Air Force Specialty Code (there are about 100 such specialty distinctions).

The effectiveness measures used in the analysis are based on the trained-person-year. This fundamental unit of effectiveness is then adjusted to account for the fact that senior personnel are worth more than junior personnel. The adjustment is done by valuing experience (time in the enlisted force) in proportion to how much pay increases with experience. The proportionality constant varies from zero (indicating that all trained-person-years are of equal value), to one (indicating an average value of experience), to two (indicating that productivity increases with experience twice as fast as pay does).

The model reports cost effectiveness results for the entire range of values of experience. The user of the model must decide which part of the value of experience range most adequately reflects conditions in the specialty being analyzed. This judgment is sometimes very easy, as the decision among alternative plans often remains the same over a wide range (sometimes the entire range) of the value of experience.

ACKNOWLEDGMENTS

Colonel Kenneth H. Fleming, Major L. James Cowardin, and Captain Kenneth J. Reynolds at the Economics Department of the United States Air Force Academy helped define the scope of this model and helped locate required data during discussions at the Academy in November 1984.

Major General W. S. Harpe, Major General T. A. Baker, Major General J. B. Davis, and Brigadier General M. D. Montgomery critically reviewed an early version of this analysis at the EFMP Broad Area Review held at the Pentagon in May 1985.

Air Force colleagues on the EFMP who have supported this work include Colonel Robert B. Walker and Lieutenant Colonel Robert S. Barnhardt (who are the Air Force managers of the EFMP), Captain Joseph R. Cafarella (who helped in developing the spreadsheet modeling techniques), and Captain Stanley Perrin and Captain Kevin Lawson (who provided insight into enlisted force behavior and costing procedures).

RAND colleagues who have supported this work include James P. Stucker, who provided several intensive Symphony tutorials; Grace M. Carter and Michael P. Murray, who performed the econometric analyses that underlie the model's behavioral equations; William T. Mickelson, who designed the enlisted force specialty groups with which the model's database is defined; Judith C. Fernandez, who reviewed a draft of this Note and who provided insights into the distinction between cost analysis to support policy decisions and cost analysis to control budgets; Glenn A. Gotz and Craig Moore, whose reviews helped define the scope of this model; Leola Cutler, who helped with data management; and Warren E. Walker, who is the RAND project leader for the EFMP.

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I. INTRODUCTION

PURPOSE OF THE MODEL

The Aggregate Lifecycle Effectiveness and Cost (ALEC) model analyzes the cost effectiveness of alternative actions used to manage Air Force enlisted personnel. Example management actions are paying bonuses to increase reenlistments, retraining personnel from one specialty to another, and using Career Job Reservations to limit entry into the second term.

ALEC is designed to analyze parts of the enlisted force that are sufficiently disaggregated to have (at least approximately) a homogeneous force management policy while being sufficiently aggregated to have a natural career progression (from Non Prior Service (NPS) accession to retirement). The model currently divides the force by Chief Enlisted Manager Progression Groups (CEMPGs), which are aggregations of Air Force Specialty Codes (AFSCs), essentially to the 3-digit level. (See App. A for definitions of CEMPGs as of September 30, 1984.)

THEORETICAL AND EMPIRICAL FOUNDATIONS

The theoretical and empirical foundations of the ALEC model are discussed in detail in the companion volume: *ALEC (Theory and Results)*. Only two points need to be stressed here.

First, the theoretical basis for the ALEC model is the realization that analyzing a cohort's lifecycle is an efficient way to compare the costs and benefits of enlisted force management actions. The management actions used to control the enlisted force tend to act on specific cohorts of enlisted personnel, and their effects are felt throughout the remaining lifecycle of that cohort. For example, a zone A bonus affects the cohort that has been in the enlisted force for one term of enlistment, and its effects persist long enough to increase the retirement benefits received by that cohort.

Second, the empirical relationships used to build the ALEC model are ones that have been developed by the Enlisted Force Management Project to support all its models. These empirical relationships come from econometric analyses of enlisted force behavior during the recent past. An example relationship used in the model is the amount by which the first term reenlistment rate increases when a zone A reenlistment bonus is offered.

OVERVIEW

User's Guide

Sections II and III constitute a complete user's guide to the ALEC model. Section II explains how to operate the model. There are only four steps:

- Load the model,
- Choose the part of the force to analyze,
- Choose management actions (one set defining the reference situation and one set defining the plan), and
- Decide on output format (graphs on screen and/or printed report).

Section III shows how to interpret the model's results, by discussing the results of an example run of ALEC. The example analysis looks at the average specialty in the high-training sector and compares a plan with a zone A bonus (multiple = 2) with a reference situation having no bonus.

Documentation

The remaining sections in the Note document the model. The appendixes document the model's database and the model's control programs.

Section V lists the inputs in the Inputs Module, distinguishing among those chosen by the user, those already on the spreadsheet as default choices, and those read in from the database once the user has

chosen the sector or CEMPG to analyze. This section also offers suggestions to users who wish to do sensitivity analyses on the inputs.

Section VI presents all the tables in the Calculation Module and reviews the work done by each of them.

Section VII shows the output that is saved from the calculation module during an ALEC run. These outputs contain all the information used to produce the ALEC REPORT (presented in Sec. III).

Appendix A presents the database that enables the model to represent different parts of the enlisted force. Appendix B gives the Symphony control programs that make the model run. Appendix C notes Symphony techniques found useful in building ALEC. These techniques should aid users who decide to revise or extend the current model.

II. OPERATING THE MODEL

The ALEC model is written in Symphony, Release 1.1, from the Lotus Development Corporation. To operate the model, one must first load the Symphony spreadsheet software into the microcomputer, second, load the ALEC model itself, and third, respond to the interface screens. Note that ALEC requires that the microcomputer be equipped with a 640 K memory, a graphics card, and a printer.

STARTING

Load Symphony

- a. Boot DOS
- b. Put Symphony system disk in port A
- b. Type "Symphony"
- c. Press [Return]

Load the ALEC model

- a. Put the ALEC disk in the port specified for inputs when the symphony software was installed.
- b. Press function key [F9].
- c. Type "F" for file.
- d. Type "R" for retrieve.
- e. Press [Return] to load ALEC.
- f. Wait 75 seconds while the ALEC model is read in.

Start ALEC

- a. Press [Return] or Type "Y" for yes.

MAKING CHOICES

Users of the ALEC model must make two kinds of choices to run the model. First, they must choose the part of the enlisted force to be analyzed. (Appendix A explains the codes that define the parts of the force.) Second, they must choose the management actions that define the plan to be analyzed and the reference situation to which that plan will be compared.

Choose the Sector or CEMPG to Analyze

The model's control program automatically places the spreadsheet cursor in the correct position to enter the choice of the part of the force to be analyzed.

- a. Type "SectorX" where X = H for the high-training sector, M for the moderate-training sector, L for the low-training sector, or S for the support sector.
- b. or, type "CEMPGxyz" where xyz is the 3-digit code for the CEMPG.
- c. Press [Return].
- d. Type [Alt-c] for continue, i.e., press the [Alt] key and while holding it down type "c." Type the "c" only once. If you type it twice, or even if you just hold it down for a time, the control program will perceive a repeated command and the database will be loaded more than once. This will not harm the model's performance, but it will increase the time until the model is ready to move on to the next step.
- e. Wait 95 seconds while the data for the chosen sector or CEMPG is read in.

Choose Management Actions Defining the Reference Situation and Plan

Here the model's control program does not automatically position the spreadsheet cursor. Rather, the user must move the cursor to the desired location by using the arrow keys.

- a. Use the arrow keys to position the cursor over the management action to be typed in.
- b. Type in the desired level of that action.
- c. Press [Return]. (If you change your mind, just type and enter a revised number).
- d. Use the [Page Down] and [Page Up] keys to toggle back and forth between the screen containing management actions that increase the force and the screen containing management actions that decrease the force.
- e. Choose both a reference-situation set of management actions, and a planned set of actions. ALEC evaluates the cost effectiveness of the planned changes from the reference situation. If the default values in place when ALEC is loaded are satisfactory, you do not need to retype them.
- f. Press [Alt-p] to evaluate the consequences of a set of management actions.
- g. Wait 35 seconds while ALEC first evaluates the reference situation and then evaluates the plan.

GETTING OUTPUT

ALEC's control program automatically brings up a prompt screen that explains the output possibilities.

Choose Output

- a. Type [Alt-r] to get a printed report of the management actions chosen and the analysis of the planned changes from the reference situation.
- b. Wait 10 seconds for the printer buffer to get the complete report.
- c. While the report is printing, look at a slide show of results by pressing function key [F6] repeatedly.

Decide on Additional Analyses

- a. Type [Alt-n] to return to the planning screens and choose a new plan and/or new reference situation for the same sector or CEMPG.
- b. Type [Alt-s] to return to the screen where a new sector or CEMPG can be chosen.

STOPPING

- a. Press function key [F9].
- b. Type "E" for exit.
- c. Type "Y" for yes.

III. INTERPRETING RESULTS

When a particular run of ALEC has been completed, the user gets a printed record of both the choices made and the results of the analysis, and the user gets to see a slide show that presents the results in a series of graphs.

An example is the best way to show what the ALEC model does. The same example is used throughout this Note. The example analyzes the average specialty in the high-training sector and compares a plan offering a zone A bonus (multiple = 2) with a reference situation having no bonus. Both the plan and the reference situation start the cohort with NPS accessions for a 4-year term of enlistment.

The ALEC model first shows the cost effectiveness of the planned change from the reference situation, and then it compares the overall performance of the plan with the reference situation. In other words, the ALEC model analyzes both the marginal effect of the planned change and the average effect.

MANAGEMENT ACTIONS DEFINING PLANS

The first page of the ALEC REPORT (see Table 3.1) reminds the user of the management actions chosen to define the reference situation and those chosen to define the plan. It also shows the difference between the plan and the reference situation, for it is that difference that is being analyzed.

Note that the only change from the reference situation in the example is the zone A bonus multiple = 2, listed under actions that increase the force.

At the bottom of page 1 there are some guidelines for choosing management actions that decrease the force. They are not relevant to analyzing zone A bonuses, but they are useful when choosing actions that decrease the force.

For example, the guidelines show that with the cohort size determined by 10000 NPS accessions, the Career Job Reservations on reenlistments from other specialties binds at 946 such reenlistments per

Table 3.1

ALEC REPORT, PAGE 1
MANAGEMENT ACTIONS DEFINING REFERENCE SITUATION AND PLAN

(High training sector)

MANAGEMENT ACTIONS (All Flows are Annual)

Action	Reference Situation	Plan	Planned Change
Actions that Increase the Force			
NPS accessions, 4-year TOE	10000	10000	0
NPS accessions, 6-year TOE	0	0	0
PS accessions, no retraining	0	0	0
PS accessions, with retraining	0	0	0
Retraining in at YOS=4	0	0	0
Retraining in at YOS=8	0	0	0
Retraining in at YOS=12	0	0	0
Zone A bonus multiple	0.0	2.0	2.0
Zone B bonus multiple	0.0	0.0	0.0
Zone C bonus multiple	0.0	0.0	0.0

Actions that Decrease the Force

Early release from first term	0	0	0
Early release from second term	0	0	0
Retraining out at YOS=4	0	0	0
Retraining out at YOS=8	0	0	0
Retraining out at YOS=12	0	0	0
CJR for own reenlistments	100000	100000	0
CJR for inflow reenlistments	100000	100000	0

GUIDELINES FOR CHOOSING MANAGEMENT ACTIONS

Maximum early release, first term	5400	4961
Maximum early release, second term	912	1442
Maximum retraining out at YOS=4	845	1583
Maximum retraining out at YOS=8	591	307
Maximum retraining out at YOS=12	464	599
CJR on own reenlistments binds at	1852	2543
CJR on other reenlistments binds at	946	1604

year. If the Career Job Reservations (CJR) are set higher than that amount, then the action will have no effect on cohort performance. If they are set lower than that amount then they will affect the force structure by limiting the number of such reenlistments.

In other words, when using the management actions that decrease the force, one must first run the ALEC model to get the guidelines report and then run the model again, choosing actions that are consistent with the guidelines.

COST EFFECTIVENESS OF PLANNED CHANGE

The second page of the ALEC REPORT (see Table 3.2) shows the results of the planned deviations from the reference situation. These results can also be seen graphically in the first four graphs in the slide show activated by repeatedly pressing the [F6] function key. These four graphs are presented in this Note as Figs. 3.1 through 3.4.

The first panel on page 2 of the report (and the first graph, Fig. 3.1) gives the distribution of the force added by the zone A bonus multiple = 2. This is the distribution of the additional trained-person-years from the cohort over its lifecycle that results from the zone A bonus.

The second panel (and the second graph, Fig. 3.2) gives the distribution of the costs added by the zone A bonus. This is the distribution of the net present values of the additional costs caused by the zone A bonus over the cohort's lifecycle.

The bottom panel of page 2 (and the third and fourth graphs) shows the cost effectiveness of planned change from the reference situation. The cost effectiveness ratio is the cost per weighted trained-person-year of the planned change divided by the cost per weighted trained-person-year in the reference situation.¹

For actions that increase the force, a cost effectiveness ratio less than 1.0 indicates that the planned change has better cost effectiveness than simply expanding the reference situation. For

¹Cost per weighted trained-person-year is the net present value of total cost over a cohort's lifecycle divided by the net present value of total weighted trained-person-years.

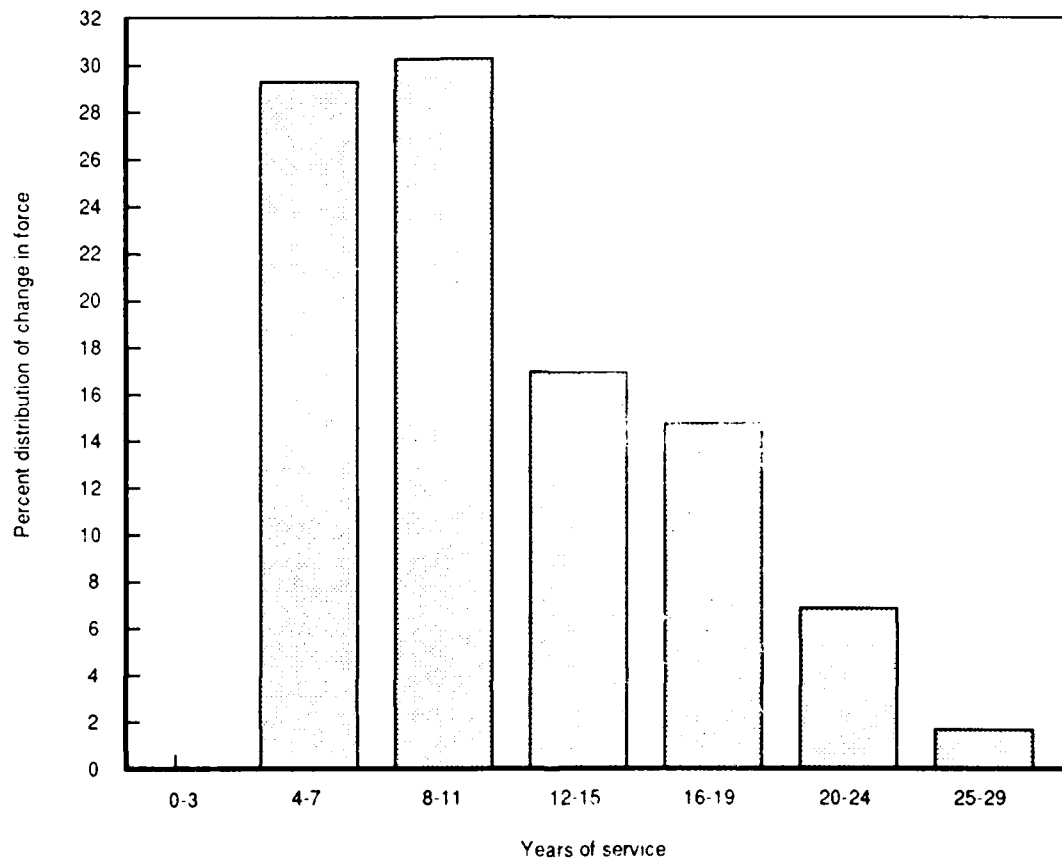


Fig. 3.1 -- Distribution of the change in trained-person-years resulting from offering a zone A bonus with multiple = 2: high training sector

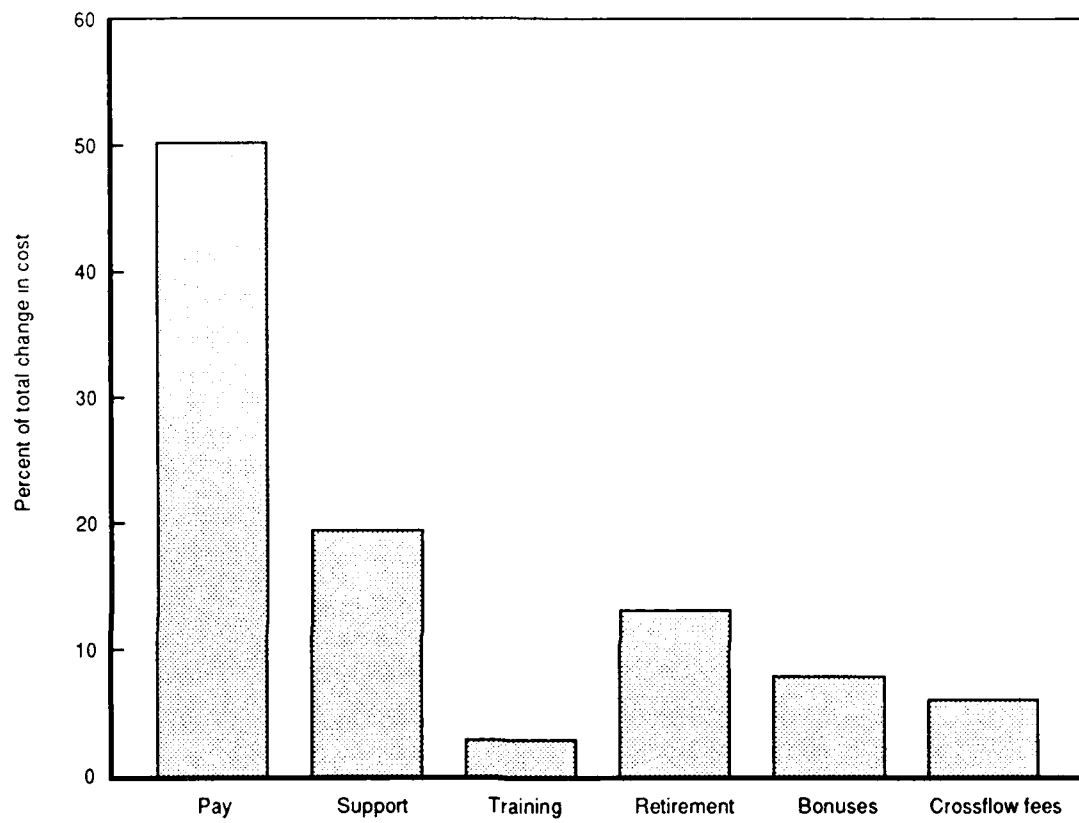


Fig. 3.2 -- Distribution of the change in costs resulting from offering a zone A bonus with multiple = 2: high training sector

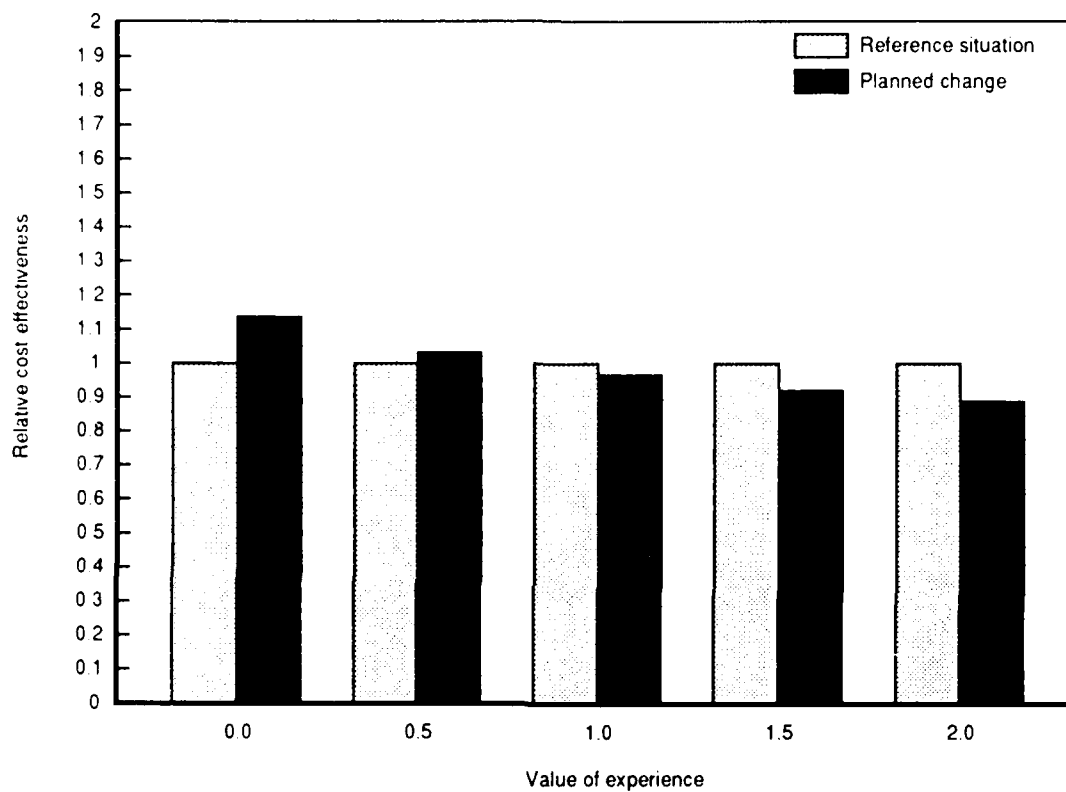


Fig. 3.3 -- Cost effectiveness of zone A bonus with multiple = 2 relative to NPS accessions with a 4-year TOE: high training sector

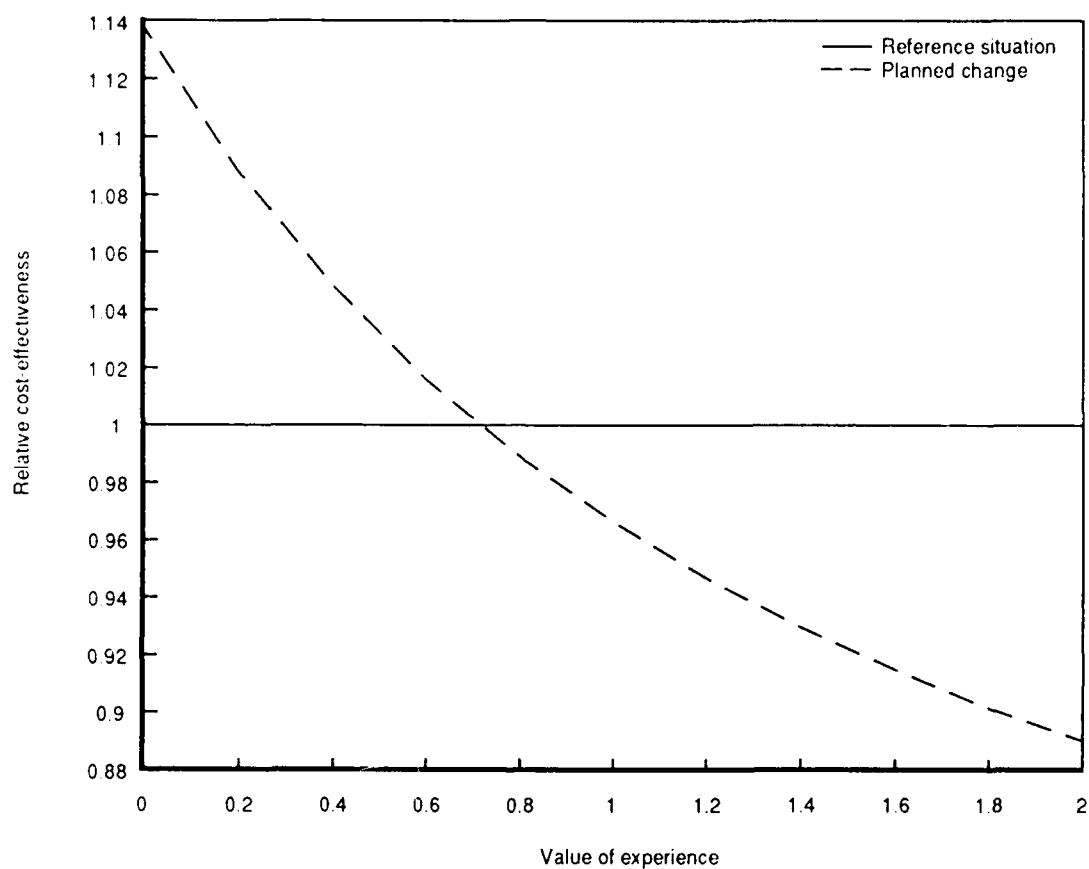


Fig. 3.4 -- Detailed analysis of the cost effectiveness of the zone A bonus relative to NPS accessions: high training sector

Table 3.2

ALEC REPORT, PAGE 2
COST EFFECTIVENESS OF CHANGE FROM REFERENCE SITUATION TO PLAN

(High training sector)

DISTRIBUTION OF CHANGE IN FORCE (Graph 1)

Years of Service	Percent Distribution of Change in Force
0-3	0.0
4-7	29.3
8-11	30.3
12-15	17.0
16-19	14.8
20-24	6.9
25-29	1.7
TOTAL	100.0

DISTRIBUTION OF CHANGE IN COST (Graph 2)

Component	Percent Distribution of Change in Cost
Trained-person pay	50.3
Support cost	19.6
Training cost	2.9
Retirement benefits	13.2
Reenlistment bonuses	8.0
Crossflow fees	6.1
TOTAL	100.0

COST EFFECTIVENESS OF PLANNED CHANGE (Graphs 3 and 4)

Item	Value of Experience (Increase in effectiveness relative to pay)				
	0.0	0.5	1.0	1.5	2.0
Cost per WTPY for ref. sit.	33894	28455	24521	21542	19209
Cost per WTPY for change	38555	29344	23685	19856	17092
Cost effectiveness ratio	1.138	1.031	0.966	0.922	0.890

NOTE: Cost per WTPY is FY84 \$ per weighted trained-person-year (WTPY).

actions that decrease the force, a cost effectiveness ratio greater than 1.0 indicates that the planned change has better cost effectiveness than simply contracting the reference situation.

The cost effectiveness results are given for a range of weighting systems defined by the increase in productivity with experience relative to the increase in pay with experience. If the value of experience parameter equals 0.0, then experience is judged to have no value, and all trained-person-years, no matter how junior or senior, are equally productive. If the value of experience parameter equals 1.0, then productivity is judged to increase in proportion to pay. If the value of experience parameter equals 2.0, then productivity is judged to increase twice as fast as pay.

For example, persons who have been in the enlisted force for 13 years earn approximately 75 percent more pay than when they started (in real dollars). If the value of experience parameter equals 0.0, the trained-person-years at the 13-year point are weighted by 1.00 (same weight as at the start).² If the value of experience parameter equals 1.0, then the weight at the 13-year point is 1.75 (75 percent larger than at the start). If the value of experience parameter equals 2.0, then the weight at the 13-year point is 2.50 (2 times 75 percent, or 150 percent, larger than at the start).³

Our example shows that zone A bonuses (with the bonus multiple = 2) are a more cost effective way of expanding the force than NPS accessions with a 4-year term (for the average specialty in the high training sector) if productivity increases at least 70 percent as much as pay does with experience. The 70 percent "breakeven" point can be roughly seen in the numbers at the bottom of page 2 of the ALEC REPORT (Table 3.2) and in the first cost effectiveness graph (Fig. 3.3) but are most easily seen in the second cost effectiveness graph (Fig. 3.4).

²See Sec. V of *ALEC (Theory and Results)* for an extensive discussion of this method of specifying the value of experience.

COMPARISON OF PLAN WITH REFERENCE SITUATION

The third page of the ALEC REPORT (and the fifth and sixth graphs in the slide show) compare the overall performance of the plan with that of the reference situation. Here we are no longer looking at the marginal effect of the planned change, but rather at the effect of the planned change on average performance of the entire cohort.

The increase in trained-person-years caused by the zone A bonus, multiple = 2, occurs predominantly between years of service 4 and 11 of the cohort's lifecycle (see top of Table 3.2 or Fig. 3.5). The difference between the reference situation's bars and the plan's bars in Fig. 3.5, is what was graphed in Fig. 3.1.

Depending on the weighting system judged to be appropriate, our example shows that the zone A bonus increases the total effectiveness of the cohort by 23 to 30 percent (see bottom of Table 3.3).

The increase in total cost of the cohort caused by the zone A bonus is 26 percent, no matter what the weighting system for effectiveness (see bottom of Table 3.3).³

The very bottom line of Table 3.3, and Fig. 3.6, shows that the zone A bonus increases the cost per weighted trained-person-year by about 2.5 percent if the value of experience is zero, and decreases it by about 2.5 percent if the value of experience increases twice as fast as pay. Table 3.3 and Fig. 3.6 show that the switch from increasing cost per unit of effectiveness to decreasing cost per unit of effectiveness occurs between values of experience 0.5 and 1.0 (and we know from Fig. 3.4 that the switch occurs at about 0.7).

DISCUSSION

This explanation of ALEC's output concludes with (a) an additional interpretation, (b) a warning, and (c) a reminder about the assumptions that lie behind the weighting system.

First, the additional interpretation. An alternative way of estimating the cost effectiveness of the planned change is to divide the

³The weighting system never affects total cost, only total effectiveness.

Table 3.3

ALEC REPORT, PAGE 3
COMPARISON OF PLAN WITH REFERENCE SITUATION

(High training sector)

TRAINED-PERSON-YEARS FROM COHORT (Graph 5)

Years of Service	Reference Situation	Plan	Planned Change
0-3	23135	23135	0
4-7	11548	16064	4516
8-11	7560	12226	4665
12-15	6060	8670	2610
16-19	5227	7504	2276
20-24	2423	3484	1060
25-29	604	868	264
Total	56558	71950	15392

COST PER WEIGHTED TRAINED-PERSON-YEAR (Graph 6)

Value of Experience
(Increase in effectiveness relative to pay)

Item	0.0	0.5	1.0	1.5	2.0
------	-----	-----	-----	-----	-----

NPV of Weighted Trained-Person-Years from Cohort

Reference situation	41815	49807	57799	65791	73782
Plan	51531	62573	73615	84657	95698
Percent change	23.2	25.6	27.4	28.7	29.7

NPV of Total Cost of Cohort (thousands of FY84 \$)

Reference situation	1417261	1417261	1417261	1417261	1417261
Plan	1791858	1791858	1791858	1791858	1791858
Percent change	26.4	26.4	26.4	26.4	26.4

Cost per Weighted Trained-Person-Year (FY84 \$)

Reference situation	33894	28455	24521	21542	19209
Plan	34773	28636	24341	21166	18724
Percent change	2.6	0.6	-0.7	-1.7	-2.5

NOTE: NPV is net present value.

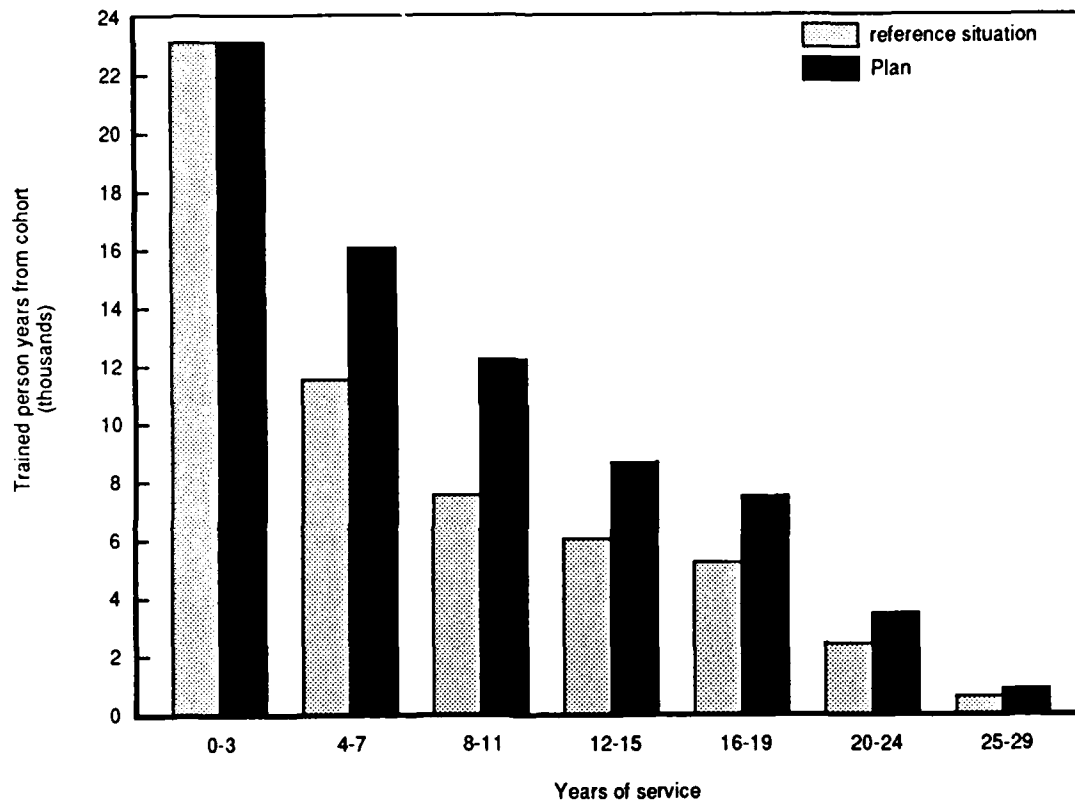


Fig. 3.5 -- Trained-person-years from plan (zone A bonus = 2) compared with that from reference situation (no bonus): High training sector

percentage change in total cost by the percentage change in total effectiveness. For instance, in the example, if the value of experience = 1.0, the percent increase in cost is 26.4 and the percent increase in effectiveness is 27.4 (see Table 3.3). The ratio of these two numbers is 0.96, which is the same (within roundoff error) as the cost effectiveness ratio reported at the bottom of Table 3.2.

A simple algebraic manipulation shows that this alternative method of estimating the cost effectiveness of the planned change always works:

$$(c/e)/(C/E) = (c/C)/(e/E) \quad (3.1)$$

where c = cost of planned change,
 e = effectiveness of planned change,
 C = cost in reference situation,
 E = effectiveness in reference situation.

Next, the warning. The cost effectiveness ratio goes awry if the percentage change in cost or the percentage change in effectiveness is close to zero. Looking at the right hand side of Eq. (3.1) shows why. If the percentage change in cost is zero, then the cost effectiveness ratio is zero. If the percentage change in effectiveness is zero, then the cost effectiveness ratio is infinitely large.

In practice, when the percentage changes are very small, for low values of experience the change in effectiveness tends to be negative, and for high values of experience the change in effectiveness tends to be positive; and over the entire range of values of experience the cost effectiveness ratio can take on any value from infinitely negative to infinitely positive.

In this situation, users of the ALEC model should ignore the results on the cost effectiveness of the planned change (Table 3.3 and Figs. 3.1 through 3.4). This advice is easy to follow because the planned change is so small that it does not matter.

However, users should not avoid analyzing situations where the plan and the reference situation have essentially the same total cost and/or total effectiveness. In fact, analyzing those situations may be one of the most useful ways to use the ALEC model.

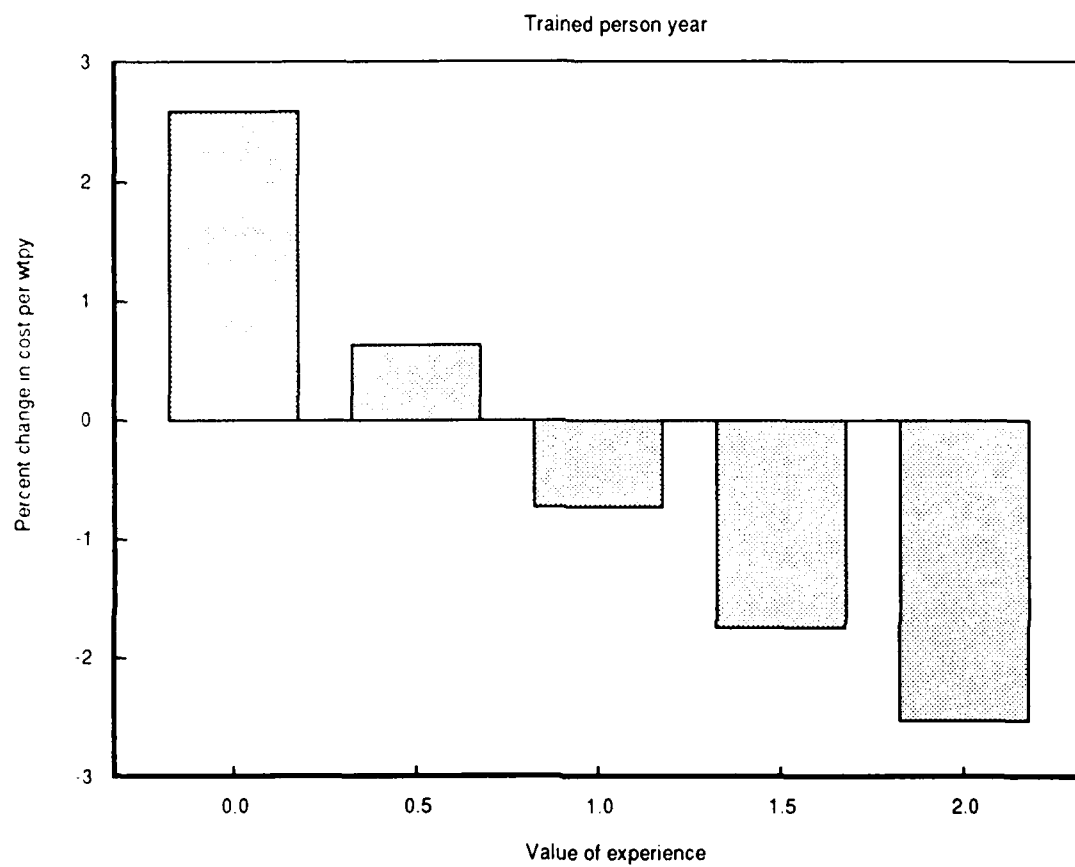


Fig. 3.6 -- Percent change in cost per weighted trained-person-year caused by a zone A bonus multiple = 2: High training sector

After all, one of the most tried and true methods of doing policy analysis is to construct two plans that have identical total costs and then compare the effectiveness of those plans. Examples of such analyses are presented at the end of Sec. VIII in *ALEC (Theory and Results)*. Just remember, when using ALEC for this type of analysis, use only Table 3.3 and Figs. 3.5 and 3.6, and do not be distressed by the wild patterns in Fig. 3.4.

Finally, a reminder about the weighting system assumptions. For all the ease of interpretation achieved by relating the weights to the pay table, the weighting system remains a simple linear one. In other words, the first additional trained-person-year at a given point in the cohort's lifecycle is given the same weight as the last additional trained-person-year at that point in the lifecycle. The weighting system does not attempt to comprehend diminishing marginal returns.

This means that the weighting system is much easier to accept for the analysis of the planned change (Table 3.2) than for the analysis of total change (Table 3.3). Section V of *ALEC (Theory and Results)* makes this point in greater detail.

Users of the ALEC model who find the weighting system inappropriate for comparing the total performance of the plan with that of the reference situation should not use all the results in Table 3.3. Those users should ignore the results on the percent increase in total effectiveness and the percent change in cost per weighted trained-person-year and concentrate solely on the percent change in total cost (bottom of Table 3.3) and on the number of trained-person-years at each point in the cohort's lifecycle (top of Table 3.3 and Fig. 3.5).

IV. OVERVIEW OF THE MODEL

MODULAR STRUCTURE

ALEC is a single spreadsheet (called "ALEC") that accesses data on a second spreadsheet (called "ALECDATA"). Both the model and the database are on the same floppy disk. The ALEC spreadsheet consists of:

The *Interface Module*, which contains user input screens and the ALEC REPORT.

The *Input Module*, which is a long column of numbers that includes copies of the user inputs, general inputs already entered on the spreadsheet, and specialty-specific inputs that are loaded from the database when the user chooses the part of the force to be analyzed.

The *Calculation Module*, which contains tables of structured calculations that trace the consequences of a set of management actions.

The *Output Module*, which assembles results to be included in the ALEC REPORT.

The user of ALEC controls the use of these modules through "macros," which are sequences of commands triggered by a macro name, such as the [Alt-c] command that tells ALEC to copy the data for the part of the force just specified by the user. The interface contains reminders of the macro names, so the user does not have to remember them to use the model. (See App. B for a listing of ALEC's macros.)

Table 4.1 shows the sequence of events that occurs during one run of ALEC. During initialization, the user chooses the part of the enlisted force to be analyzed, waits while the required data are loaded from the database, chooses a reference situation and chooses a plan. (See App. A for the definition of parts of the enlisted force that ALEC can analyze.)

Table 4.1
STEPS IN AN ALEC ANALYSIS

Analysis Step	Module			
	Inter- face	Input	Calcu- lation	Output
Initialization				
1. Choose specialty	x			
2. Get data on specialty		x		
3. Define reference situation	x			
4. Define plan	x			
Analysis of Reference Situation				
5. Read in reference situation		x		
6. Estimate results			x	
7. Store summary results				x
Analysis of Plan				
5. Read in plan		x		
6. Estimate results			x	
7. Store summary results				x
Evaluation of Changes Caused by Plan				
8. Estimate changes				x
9. Graph results	x			
10. Print report	x			

Then, when the user types [Alt-p], ALEC projects the consequences of the management actions that the user has chosen. ALEC does the projection by first copying the management actions that define the reference situation from the input screen to the Input Module, calculating the spreadsheet and copying the results to the Output Module. Next, ALEC copies the management actions that define the plan to the Input Module, recalculating the spreadsheet and copying these results to the Output Module.

Finally, the changes in cost and effectiveness caused by the planned deviation from the reference situation, and the overall characteristics of the reference situation and plan, are computed and placed in the ALEC REPORT, and in the ranges of the slide show's graphs.

SPREADSHEET LAYOUT

Figure 4.1 shows the layout of ALEC on the Symphony spreadsheet. To examine a particular part of the model, place the spreadsheet cursor on the location given in the upper left hand corner of a box, and then page down screen after screen until the entire submodel has been scanned. In other words, each submodule of ALEC is stacked vertically on the spreadsheet.

The ALEC report is at the extreme left of the spreadsheet and way down (it starts at line 600). The reason for this placement is so that changes in the report (such as deleting or adding lines) can be done without danger of altering anything to the right of the report. The report is low enough on the spreadsheet so that there is nothing to the right of it. The report has to start in column A, because the Symphony word processor language that helps construct the report works only on material entered in column A.

Three parts of ALEC are not displayed in Fig. 4.1. They are (a) the macros that control the model (they start at location I1, one screen to the right of the Interface Module), (b) the menu that starts the model (it is at location Y1), and (c) the plotting points for some of the graphs (they are just to the right of the ALEC REPORT).

All the spreadsheet tables contained in the boxes of Fig. 4.1 are printed in the various sections and subsections of the remainder of this Note. However, the formulas that calculate the numbers in these tables are not printed in this Note. There are too many formulas, and the vast majority of them are trivial (such as formulas that sum or average all the entries in a line).

To examine a calculation formula, place the spreadsheet cursor on the entry in question. The formula that generated that entry will appear on the upper left of the screen. To understand a calculation formula, consult the theoretical discussions in *ALEC (Theory and Results)* where all of ALEC's nontrivial formulas are derived.

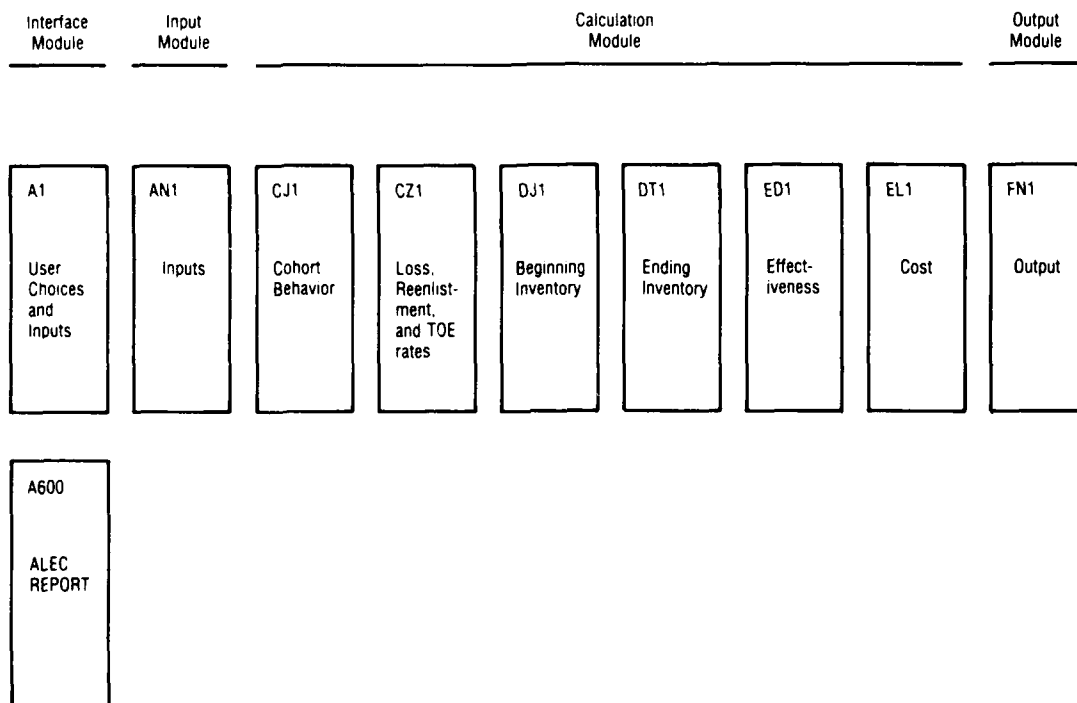


Fig. 4.1 -- Spreadsheet layout of the ALEC model

Unfortunately, spreadsheets name variables by cell addresses. So part of the work involved in checking or revising a spreadsheet formula is working backward to find the meaning of all the variables used in a formula. In practice, this work does not take much time, but it is frustrating.

Spreadsheets do present the overall logic of a calculation in tables that can be comprehended at a glance. This property makes checking or revising a spreadsheet program very easy.

When examining the model's calculation tables, keep in mind that they reflect the analysis done for the plan rather than that for the reference situation. ALEC analyzes the reference situation first and then uses the same calculation tables to analyze the plan. Consequently, when a run is completed, it is the plan's results that sit in all the calculation tables. The Output Module and the ALEC REPORT, of course, contain results for both the reference situation and the plan.

The reuse of the Calculation Module was necessary to keep the size of the ALEC spreadsheet small enough for it to fit in the 640 K memory of current microcomputers. (The Symphony spreadsheet program takes up about half of this available memory, and the ALEC model takes up almost the entire other half.)

V. INPUT MODULE

Column "AT" on the ALEC spreadsheet contains inputs to the model.¹ This format has two virtues. First, to examine the input variables, move the spreadsheet cursor to location AN1. The input variables will be on the right-hand side of the screen, and the variable descriptions will be on the left. Paging down the spreadsheet will rapidly display the inputs.

The second virtue of this format is that whenever a spreadsheet formula contains an "AT" variable, you know at once it is an input variable (rather than the result of an intermediate calculation).

The tables at the end of this section list the inputs in three categories: user inputs, general inputs, and specialty-specific inputs. To the left of the variable description in these tables there is a line number. The combination of "AT" plus that line number is the variable name in the ALEC model. When analyzing ALEC formulas, using these documentation tables to find the spreadsheet names of the variables is faster than looking up the variable on the spreadsheet.

USER INPUTS

User inputs to ALEC are typed in by the user during each run of the model (or the defaults in place when the model is loaded are accepted by the user). These inputs are the management actions that define the reference situation and the management actions that define the plan to be compared with the reference situation (see Table 5.1).

¹The "AT" column does not, however, contain all of ALEC's inputs. Inputs entered elsewhere on the spreadsheet include: (a) the coefficients in the econometric equations predicting losses, reenlistments, and terms of enlistment; (b) the coefficients predicting the effect of reenlistment bonuses on the probability of staying in the same specialty at the end of the first term; and (c) the crossflow fees paid to origin and destination specialties to hold their cost effectiveness constant when retraining flows occur. These variables are inputs to ALEC, but for ease of comprehension they are entered directly into the calculation tables where they are needed. (They are easy to define in the context of those calculation tables, but difficult to define out of that context). All the comments below on "General Inputs" also apply to these variables.

Table 5.1

USER INPUTS TO ALEC

Location on Spreadsheet in Column AT	Description of Input Variable	Value of Variable
Actions to Increase the Force:		
8	NPS 4 years	10000
9	NPS 6 years	0
10	PS no retraining	0
11	PS with retraining	0
13	Retrain in YOS4	0
14	Retrain in YOS8	0
15	Retrain in YOS12	0
17	A bonus multiple	2.0
18	B bonus multiple	0.0
19	C bonus multiple	0.0
Actions to Decrease the Force:		
27	Early release 1	0
28	Early release 2	0
30	Retrain out YOS4	0
31	Retrain out YOS8	0
32	Retrain out YOS12	0
34	CJR own	100000
35	CJR other	100000

These inputs are not typed in at the "AT" location, but rather are entered in the user interface part of the spreadsheet (the first eight columns, two screens down). The model's control programs (see App. B) automatically direct the user to the correct place for entering the user inputs.

When the model is run, it first copies the reference situation's management actions to the "AT" column and calculates the spreadsheet to analyze the reference situation. Then, after copying the reference

situation results to the output part of the spreadsheet, it copies the plan's management actions to the "AT" column and calculates the spreadsheet to analyze the plan. Because the model operates this way, the user inputs in the "AT" column after a model run are always the management actions defining the plan.

GENERAL INPUTS

The general inputs to ALEC (see Table 5.2) are on the spreadsheet when the model is loaded into the microcomputer. The user interface, as currently designed, does not prompt the user to consider revising these variables. Nor do these variables change when different parts of the enlisted force are chosen for analysis (and the appropriate data are read in from the database).

Nevertheless, if a user wants to change one or more of these general inputs, doing so is very easy. Just move the spreadsheet cursor to the variable location, type in the new variable value, and press the return key. Now the default variable for the input variable is gone and the new value is in its place, and the model will use the new value in all subsequent calculations.

Three cautionary notes are important if such changes are made. First, remember to write down the changes and attach them to the ALEC REPORT, as the standard report format contains no warning that a general input has been altered. Second, if the model with the revised inputs is saved, it should be saved on a new disk, and that disk should be given a distinctive name. The disk with the default values on it should remain unaltered so that a common ALEC model can always be accessed.

Third, and most important, always change an input at its original point of entry into the spreadsheet. If you change it at a location to which it has been copied by a spreadsheet formula, then the model will no longer give correct answers. You can always tell the original point of entry--when the cursor is placed on that point a number rather than a spreadsheet formula appears in the top left corner of the screen. (All the "AT" locations for the general inputs are original points of entry.)

The ease with which background assumptions of the ALEC model can be changed makes doing sensitivity analysis of the assumptions very simple. Appendix C of *ALEC (Theory and Results)* contains two examples of sensitivity analyses.

Table 5.2
GENERAL INPUTS TO ALEC

Location on Spreadsheet in Column AT	Description of Input Variable	Value of Variable	Location on Spreadsheet in Column AT	Description of Input Variable	Value of Variable
44	Economic Conditions		110		13528
45	Real discount rate (enter as a fraction)	4.0%	111		14559
46	Military/civilian wage ratio	0.927	112		15405
	Civilian unemployment rate (%)	6.7	113		16342
			114		16622
53	Cohort Characteristics		115		17728
54	Duration of BMT (weeks)	6.0	116		17993
55	Fraction of OJT spent not working	0.4	117		18701
	Cost of BMT (FY84 dollars)	4604	118		18915
			119		19647
60	Cost Factors		120		19951
61	Support cost per person-year	7112	121		20975
	Fraction of bonus paid in lump sum	0.75	122		21323
	Basic Pay and Total Pay		123		22252
	Monthly Basic Pay		124		22660
			125		23617
69	YOS		126		24187
70	0	647	127		25195
71	1	692	128		25325
72	2	739	129		26463
73	3	783	130		26955
74	4	841	131		29284
75	5	908	132		29874
76	6	920	133		30155
77	7	992	134		32143
78	8	1005	135		35145
79	9	1056	136		36572
80	10	1068	137		
81	11	1108		Annual total pay for 4-year TOE	
82	12	1128	141	0	11772
83	13	1214	142	1	12755
84	14	1235	143	2	13376
85	15	1300		Annual total pay for 6-year TOE	
86	16	1326			
87	17	1396	147	0	12908
88	18	1433	148	1	12908
89	19	1505	149	2	14116
90	20	1513		Some Careers Program Coefficients	
91	21	1591		K2 = Add'l fraction staying per bonus	
92	22	1624	154	multiple	0.0622
93	23	1793		K4 = Fraction increase in inflow per	
94	24	1832	155	bonus multiple	0.264
95	25	1851		K5 = Fraction of rejected own reen	
96	26	1982	156	that leave AF	0.5
97	27	2209		Effect of civilian unemployment on	
98	28	2303		retirement rates	
	29	2303		Coef. of log % unempl. in ret. rate eq.	-0.1352
	Annual Total Pay		159		
108	YOS				
109	0	11914			
	1	12847			

If you do a sensitivity analysis by systematically varying an input over some range, remember to restore the original default value before going on to another sensitivity analysis. If you have gotten caught up in multiple-variable sensitivity analyses, and have diverged considerably from the default case, the simplest way to get back on track is to reload the original ALEC model. As additional insurance to avoid confusion, keep a test-run handy and rerun it every so often to be sure the model is giving the same answers.

SPECIALTY-SPECIFIC INPUTS

The specialty-specific inputs (see Table 5.3) are loaded from the ALEC database each time a new part of the enlisted force is chosen for analysis. Consult App. A for definitions of the variables in Table 5.3. The cryptic names in the table are fairly easy to remember once they have been defined but are not very illuminating at first glance.

Like the general inputs, these variables can be altered by the user, for the purposes of doing sensitivity analyses, by simply typing new values in column "AT." However, if a permanent change is desired it must be done on the ALEC database spreadsheet because every time a new part of the enlisted force is chosen for analysis the relevant data from the database are loaded into the model's spreadsheet. These new data replace any and all specialty-specific variable values already on the model's spreadsheet.

Table 5.3
SPECIALTY-SPECIFIC INPUTS TO ALEC

Location on Spreadsheet in Column AT	Description of Input Variable	Value of Variable	Location on Spreadsheet in Column AT	Description of Input Variable	Value of Variable
161	SG	H	224	SG	H
162	CEMPG	H	225	CEMPG	H
163	Description	High-training Sector	226	LCY6	0.009
Inventory of Enlisted Personnel, 30 September 1984			227	LCY5	0.012
167	F4	34670	228	LCY4	0.011
168	F6	6246	229	LCY3	0.011
169	SEC	19517	230	LCY2	0.011
170	CAR	17815	231	LCY1	0.036
171	RET	5243	232	LCY0	0.33
172	TOTAL	83491	233	LCY-1	0.399
Training Characteristics and Bonus Multiples			Loss Rates: Retirement Terms, YOS = 19-24		
176	SG	H	237	SG	H
177	CEMPG	H	238	CEMPG	H
178	TRAIN	43.8	239	LRV19	0.314
179	COST	16444	240	LRV20	0.328
180	OJT	11.23	241	LRV21	0.229
181	A	1.3	242	LRV22	0.276
182	B	1.1	243	LRV23	0.202
183	C	0.6	244	LRV24	0.155
Loss Rates: First Term, 4-Year TOE			Loss Rates: Retirement Terms, YOS = 25-29		
187	SG	H	248	SG	H
188	CEMPG	H	249	CEMPG	H
189	LF4Y0	0.112	250	LRV25	0.373
190	LF4Y1	0.057	251	LRV26	0.196
191	LF4Y2	0.039	252	LRV27	0.281
192	LF4Y3	0.509	253	LRV28	0.095
193	LF4Y4	0.395	254	LRV29	1
194	LF4Y5	0.446	Extension Rates		
195			258	SG	H
Loss Rates: First Term, 6-Year TOE			259	CEMPG	H
198	SG	H	260	EF4Y3	0.585
199	CEMPG	H	261	EF4Y4	0.627
200	LF6Y0	0.107	262	EF6Y5	0.558
201	LF6Y1	0.056	263	EF6Y6	0.275
202	LF6Y2	0.04	264	ESY1	0.474
203	LF6Y3	0.04	265	ESY0	0.532
204	LF6Y4	0.04	266	ESY0	0.532
205	LF6Y5	0.459	267	ECY1	0.18
206	LF6Y6	0.173	267	ECY0	0.635
207	LF6Y7	0.1	Careers-Program Coefficients		
208	LF6Y8	0.173	271	SG	H
209	LF6Y9	0.1	272	CEMPG	H
210	LF6Y0	0.1	273	CFGP	H
211	SG	H	274	STAYSC	0.6996
212	CEMPG	H	275	CCONSK	31.246
213	LSY6	0.008	276	CCONEM	19.053
214	LSY5	0.025	277	CCONCR	11.723
215	LSY4	0.02	278	CCONFS	14.455
216	LSY3	0.027	279	CCONOT	24.23
217	LSY2	0.035			
218	LSY1	0.25			
219	LSY0	0.237			
220	LSY-1	0.145			

VI. CALCULATION MODULE

The transformation of input variables into the outputs necessary to produce the ALEC REPORT occurs in the calculation module. This module is used twice during an ALEC run, once to analyze the reference situation and again to analyze the plan. The numbers in the tables are those for the analysis of the example plan used throughout this documentation (zone A bonus, multiple = 2).

The calculation module has six submodules: (a) cohort behavior; (b) loss, reenlistment, and term of enlistment (TOE) rates; (c) beginning inventory; (d) ending inventory; (e) effectiveness; and (f) cost. This section discusses each part in a separate subsection. The relevant calculation tables are grouped at the ends of each subsection.

Sections IV, V, and VI of *ALEC (Theory and Results)* explain the theory and empirical relationships used in building ALEC's calculation module.

The central mechanism of the calculation module is contained in the submodules that model the beginning and ending inventories. The beginning inventory describes the fate during a year of personnel who exist at the start of a year. The ending inventory describes the origin during a year of all personnel who exist at the end of the year. The two parts are linked together by the fact that the ending inventory for a given cohort year must equal the beginning inventory for the next cohort year.

The tables presenting the beginning and ending inventories look identical, however, because both tables describe the inventory by start of the year accounting of cohort time. In other words, the end of the year inventory is classified by the time-in-service at the start of the next cohort year. (The formulas behind the numbers in each table are different, even though the numbers in the tables are the same.)

COHORT BEHAVIOR

Background Material

Each submodule tends to start with some material that is necessary but does not fit neatly into calculation tables. In the case of cohort behavior this material consists of the calculation of the probability that an extension is for a year or less (see Table 6.1). Appendix B of *ALEC (Theory and Results)* explains why this variable is necessary to implement the loss and reenlistment models.

The background material also contains dummy variables that can be used to short-circuit parts of the bonus effect, so that analyses can be done of the independent effects of each part. See Fig. 4.1 in *ALEC (Theory and Results)* for one such analysis.

Loss Rate Behavior

The loss rate models (Tables 6.2 and 6.3) are linear equations, with the independent variables being bonus multiples, the military/civilian wage ratio, and the civilian unemployment rate.

The center of the table contains the econometric coefficients that give the marginal effect of each independent variable. (This is the original point of entry of these coefficients, so if they are to be revised for sensitivity analysis, this is the place to do the revision.)¹

Table 6.1

BACKGROUND MATERIAL

Probability (P) of one year extension, given extension

First term	0.407
Second term	0.418
Career term	0.407

BONUS-EFFECT SWITCHES (=1 if on, =0 if off)

Loss and extension	1
Term of enlistment	1
Specialty stability	1

¹These coefficients are defined in Tables 4.2, 4.3, and 4.4 in *ALEC (Theory and Results)*.

Table 6.2
LOSS RATE BEHAVIOR (ZONES A AND B)

YETS	REF.	ZONE A BONUS M=1	ZONE A BONUS M>1	ZONE B BONUS M=1	ZONE B BONUS M>1	ZONE C BONUS	WAGE RATIO	UNEMPL RATE	TRIAL RESULT	MIN.	FINAL RESULT
Existence=1											
Variable values:											
		1	1	0	0	0	0.927	6.7			
Loss rates, first term, 4-year TOE, zone A											
1	0.509	-0.034	-0.013				-0.437	-0.361	0.462	0	0.462
0	0.395						0.051	-0.165	0.395	0	0.395
-1	0.446						0.125	-0.404	0.446	0	0.446
Loss rates, first term, 6-year TOE, zone A											
1	0.459	-0.034	-0.013				-0.437	0	0.412	0	0.412
0	0.173						0.051	-0.165	0.173	0	0.173
-1	0.1						0.125	-0.404	0.100	0	0.100
Loss rates, first term, 6-year TOE, zone B											
1	0.459			-0.034	-0.013		-0.437	-0.361	0.459	0	0.459
0	0.173						0.051	-0.165	0.173	0	0.173
-1	0.1						0.125	-0.404	0.100	0	0.100
Loss rates, second term, zone B											
1	0.25	0.037		-0.042	-0.042		-0.128	-0.234	0.287	0	0.287
0	0.237						-0.400	-0.146	0.237	0	0.237
-1	0.145						-0.957	-0.349	0.145	0	0.145

Table 6.3

LOSS RATE BEHAVIOR (ZONE C)

YETS	REF.	ZONE A BONUS M=1	ZONE A BONUS M>1	ZONE B BONUS M=1	ZONE B BONUS M>1	ZONE C BONUS	WAGE RATIO	UNEMPL RATE	TRIAL RESULT	MIN.	FINAL RESULT
Existence=1											
Variable values:											
		1	1	0	0	0	0.927	6.7			
Loss rates, second term, zone C											
1	0.25	0.037				-0.042	-0.128	-0.234	0.287	0	0.287
0	0.237						-0.400	-0.146	0.237	0	0.237
-1	0.145						-0.957	-0.349	0.145	0	0.145
Loss rates, second term, post zone C											
1	0.25	0.037					-0.128	-0.234	0.287	0	0.287
0	0.237						-0.400	-0.146	0.237	0	0.237
-1	0.145						-0.957	-0.349	0.145	0	0.145
Loss rates, career term, zone C											
1	0.036					-0.009	-0.162	-0.051	0.036	0	0.036
0	0.330					-0.003	-0.055	-0.042	0.330	0	0.330
-1	0.399					-0.007	-0.134	-0.102	0.399	0	0.399
Loss rates, career term, post zone C											
1	0.036						-0.162	-0.051	0.036	0	0.036
0	0.330						-0.055	-0.042	0.330	0	0.330
-1	0.399						-0.134	-0.102	0.399	0	0.399

The right hand side of the table checks to be sure that the estimated loss rate is not less than zero; if it is less than zero, then the final result is set equal to zero.

Extension Rate Behavior

In parallel with the loss rate models, the extension rate models (Table 6.4) are also linear equations, with the independent variables being bonus multiples, the military/civilian wage ratio, and the civilian unemployment rate.

The center of the table contains the econometric coefficients that give the marginal effect of each independent variable. (Again, this is the original point of entry for these coefficients, so if they are to be revised for sensitivity analysis, this is the place to do the revision.)

The right hand side of the table checks to be sure that the estimated extension rate is not less than zero; if it is less than zero then the final result is set equal to zero.

Term of Enlistment Behavior

Table 6.5 implements the effect that reenlistment bonuses have on the TOE chosen by enlisted personnel who reenlist. The implementation is done by a table look up, to find the coefficient that is appropriate for the bonus multiple in the plan being analyzed. A linear interpolation algorithm is built into this look up procedure, so if a fractional bonus multiple is used in a plan, a reasonable estimate of the term of enlistment will be made.

The TOE numbers beside the bonus multiples 0 through 6 are at the original points of entry of these coefficients, so if changes are to be made they must be made here.

The bottom of Table 6.5 implements the linear specialty stability model that predicts the proportion of reenlistments that choose to stay in their original specialty. The bonus coefficients are at their original point of entry into the ALEC model.

Table 6.4
EXTENSION RATE BEHAVIOR

YETS	REF. RATE	ZONE A BONUS	ZONE B BONUS	ZONE C BONUS	WAGE RATIO	UNEMPL RATE	PLAN RATE	LOWER LIMIT	FINAL RATE
Variable Values		2	0	0	0.927	6.7			
Extension rates, first term, 4-year TOE, zone A									
1	0.585	-0.038					0.509	0	0.509
0	0.627						0.627	0	0.627
Extension rates, first term, 6-year TOE, zone A									
1	0.558	-0.038					0.482	0	0.482
0	0.275						0.275	0	0.275
Extension rates, first term, 6-year TOE, zone B									
1	0.558		-0.038				0.558	0	0.558
0	0.275						0.275	0	0.275
Extension rates, second term, zone B									
1	0.474		-0.142		-0.633	-0.376	0.474	0	0.474
0	0.532						0.532	0	0.532
Extension rates, second term, zone C									
1	0.474			-0.142	-0.633	-0.376	0.474	0	0.474
0	0.532						0.532	0	0.532
Extension rates, second term, post zone C									
1	0.474				-0.633	-0.376	0.474	0	0.474
0	0.532						0.532	0	0.532
Extension rates, career term, zone C									
1	0.18						0.180	0	0.180
0	0.635						0.635	0	0.635
Extension rates, career term, post zone C									
1	0.18						0.180	0	0.180
0	0.635						0.635	0	0.635

Table 6.5

TERM OF ENLISTMENT BEHAVIOR

PROBABILITY OF CHOOSING A FOUR-YEAR TERM OF ENLISTMENT
(Given a decision to reenlist)

Used by Plan	Reenlistment from Zone A		
	Bonus Multiple	From 4-year 1st term	From 6-year 1st term
	0	0.910	0.694
	1	0.355	0.135
	2	0.279	0.059
	3	0.203	0.000
	4	0.127	0.000
	5	0.051	0.000
	6	0.000	0.000
Plan	2	0.279	0.059

Reenlistment from Zone B

	0	0.831
	1	0.154
	2	0.154
	3	0.154
	4	0.154
	5	0.154
	6	0.154
Plan	0	0.831

Reenlistment from Zone C

	0	0.816
	1	0.450
	2	0.450
	3	0.450
	4	0.450
	5	0.450
	6	0.450
Plan	0	0.816

PROBABILITY OF STAYING IN THE SAME SPECIALTY
(Given reenlistment from the first term)

Zone	Const.	Bonus Coef.	Bonus Multiple	Trial Result	Max	Final Result
A	0.6996	0.0622	2	0.8240	1.0000	0.8240
B	0.6996	0.0622	0	0.6996	1.0000	0.6996

Retirement Behavior

Table 6.6 contains estimates of retirement program rules (top of table) and demographic behavior of retirees (bottom of table). Both sets of numbers are input data to ALEC, and this is the original point of entry of this data.

LOSS, REENLISTMENT, AND TOE RATES

The tables in this submodule use the cohort behavior estimated in the previous submodule to fill out tables of loss, reenlistment, and TOE rates.

The format of each table is the same. Years to end of term of service (ETS) runs across the top of the table. Vertically the table is split into first, second, career, and retirement-eligible terms. Then, each term is divided into years of service.

This is the ALEC model's format for inventory and flow accounting. It is used both throughout this submodule and in the next two submodules.

Table 6.7 presents the loss rates. These are the probabilities that a person in the enlisted force at the start of the year will leave the Air Force during the year. The specific probabilities in the table are, of course, estimated for the situation being analyzed in the example run of ALEC. That situation is the average specialty in the high-training sector, when the specialty is offered a zone A reenlistment bonus (multiple = 2).

Table 6.8 contains reenlistment rates. These are the probabilities that a person in the enlisted force at the start of the year, who does not leave during the year, will reenlist during the year.

Finally, Table 6.9 shows the TOE rates, the probability that a person who reenlists does so for a four-year term of enlistment (rather than a six-year term of enlistment). These probabilities of reenlisting for a four-year TOE are considerably lower than they would be if a zone A bonus was not being offered.

Table 6.6

RETIREMENT BEHAVIOR

Retirement pay as fraction of basic pay at time of retirement

YOS at Start of Year in Which Retirement Occurs	Fraction Basic Pay Received as Retirement Benefit
19	0.500
20	0.525
21	0.550
22	0.575
23	0.600
24	0.625
25	0.650
26	0.675
27	0.700
28	0.725
29	0.750

Fraction of retirees surviving to a given age

Biological Age (years)	Fraction Surviving to Age
40-49	0.984
50-59	0.929
60-69	0.807
70-79	0.567
80-89	0.235
90-99	0.033

Table 6.7

LOSS RATES

(Probability of loss during year)

[illegible]

Table 6.8

REENLISTMENT RATES

(Probability of reenlistment during year, given loss)

[illegible]

BEGINNING INVENTORY

This submodule and the next are the two most important submodules in ALEC. They do the inventory projection throughout the lifecycle of the cohort. This submodule traces what happens to the beginning inventory during a cohort year, by splitting that inventory into many pieces. Then the next submodule takes those pieces that remain in the enlisted force (reenlistments and continuations) and adds new pieces (gains) and assembles the ending inventory for a cohort year.

The pieces into which the beginning inventory (Table 6.10) is split are: losses (Table 6.11), reenlistments for four years (Table 6.12), reenlistments for six years (Table 6.12), and continuations (Table 6.16). Continuations equal beginning inventory less losses and reenlistments.

Modeling the effect of management actions on these flows requires two tables with side calculations. The first such table estimates CAREER Program flows, taking both reenlistment bonuses and CJRs into account (Table 6.14). The second such table determines the location in ALEC's accounting format of the sources of early releases (Table 6.15). All the entries in Table 6.15 are zero in this example because the example does not use the early release program. The table is presented here so that all parts of the spreadsheet model are included in this documentation.

ENDING INVENTORY

The previous submodule split the beginning inventory apart. This submodule now assembles those pieces that remain in the Air Force, and adds gains, to form the ending inventory.

Table 6.17 contains those persons in the beginning inventory who neither left nor reenlisted during the cohort year. The counts are in different cells in this table than they were in Table 6.16, however. The counts in Table 6.16 have "slid diagonally" to age them one year. The diagonal slide increases YOS by one year and decreases YETS by one year. This aging is necessary because the ending inventory is accounted for by its characteristics at the start of the next cohort year.

Table 6.10

BEGINNING INVENTORY

[illegible]

Table 6.11
LOSSES DURING YEAR

YOS	Years to ETS								Total
	6	5	4	3	2	1	0	-1	
First Term									
0	0		1120						1120
1		0		506					506
2			0		327				327
3				0		3718			3718
4					0		870		870
5						0		373	373
6							0		0
7								0	0
Total									6914
Second Term									
4	18	0	18						36
5	3	57	3	24					86
6	3	9	47	4	30				92
7	0	8	7	62	5	235			317
8	0	0	6	9	78	37	66		196
9		0	0	9	12	621	10	16	668
10			0	0	11	92	173	3	278
11				0	0	85	26	43	154
12					0	0	24	6	30
13						0	0	6	6
14							0	0	0
15								0	0
Total									1863
Career Terms									
8	0	0	3						3
9	0	1	1	3					5
10	1	0	9	1	3				15
11	1	2	4	9	1	9			25
12	1	1	7	4	9	4	14		40
13	0	1	2	7	4	28	7	7	57
14	1	0	7	2	7	12	45	3	79
15	0	1	4	7	2	22	19	23	80
16	0	0	7	4	7	8	36	10	71
17	0	0	2	7	4	23	12	18	66
18	0	0	6	2	7	12	37	6	70
Total									511
Retirement-eligible Terms									
19									557
20									399
21									187
22									174
23									92
24									56
25									115
26									38
27									44
28									11
29									101
Total									1773
Grand total									11060

Table 6.12

REENLISTMENTS DURING YEAR, FOR A 4-YEAR TERM

	Years to ETS								
YOS	6	5	4	3	2	1	0	-1	Total
First Term									
0									
1									
2									
3						593			593
4							139		139
5						0		129	129
6							0		0
7								0	0
Total									861
Second Term									
4						0	0	0	0
5						0	0	0	0
6						0	0	0	0
7						255	0	0	255
8						40	82	0	122
9						674	13	80	767
10						98	213	12	323
11						91	31	207	329
12						0	29	31	60
13						0	0	28	28
14						0	0	0	0
15						0	0	0	0
Total									1884
Career Terms									
8						0	0	0	0
9						0	0	0	0
10						0	0	0	0
11						159	0	0	159
12						76	9	0	85
13						510	4	11	525
14						265	34	5	304
15						490	14	35	540
16						165	26	15	206
17						506	9	28	542
18						0	0	0	0
Total									2361
Retirement-eligible Terms									
19									0
20									0
21									0
22									0
23									0
24									0
25									0
26									0
27									0
28									0
29									0
Total									0
Grand total									5106

Table 6.13

REENLISTMENTS DURING YEAR, FOR A 6-YEAR TERM

[illegible]

Table 6.14

CALCULATION OF CAREER PROGRAM FLOWS

Total first term reenlistments	3086
Stayers (using Zone A bonus effect)	2543 CJR-own binds
Movers to other specialties (in spite of bonus)	543
Inflow from other specialties	
Historical inflow	1103
Ratio to FY84 end strength: Ratio X	0.0132
Sector average of End Strength/NPS: Ratio Y	7.159
Estimator inflow, if no bonus: (x)(y)(NPS)	946
Estimator inflow, with bonus	1604 CJR-other binds
Reestimates to take account of CJR caps	
Stayers	2543
Movers out	543
Extra losses due to CJR-own cap	0
Movers in	1604

Table 6.18 contains side calculations necessary to model the effect of management actions on reenlistment flows.

Table 6.19 counts reenlistments, not by where they came from as was done in Tables 6.12 and 6.13, but by where they go to. For example, reenlistments out of the first term go to the second term, and that is where they are counted in Table 6.19.

Table 6.20 counts the gains during the cohort year. NPS accessions enter on the YOS = 0 line in the first term, and PS accessions enter on the YOS = 4 line in the second term.

Table 6.21 assembles the ending inventory. It equals the sum of continuations, reenlistments, and gains.

Table 6.15

EXAMPLE LAYOUT OF SOURCE OF EARLY RELEASES

	Years to ETS								
YOS	6	5	4	3	2	1	0	-1	Total
First Term									
0									
1									
2									0
3						0	0	0	0
4						0	0	0	0
5						0	0	0	0
6						0	0	0	0
7						0	0	0	0
Total									0
Second Term									
4									
5									
6									0
7						0	0	0	0
8						0	0	0	0
9						0	0	0	0
10						0	0	0	0
11						0	0	0	0
12						0	0	0	0
13						0	0	0	0
14						0	0	0	0
15						0	0	0	0
Total									0
Career Terms									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
Total									
Retirement-eligible Terms									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
Total									
Grand total									0

Table 6.16

CONTINUATIONS DURING YEAR

[illegible]

Table 6.17
CONTINUATIONS DURING YEAR

	Years to ETS								
YOS	6	5	4	3	2	1	0	-1	Total
First Term									
0									0
1		0		8880					8880
2			0		8374				8374
3				0		8047			8047
4					0		2204		2204
5						0		836	836
6							0		0
7								0	0
Total									28341
Second Term									
4									0
5		2279	0	871					3150
6		356	2222	136	848				3561
7		331	347	2304	132	818			3933
8		0	323	340	2242	128	276		3309
9		0	0	316	331	2163	43	112	2966
10			0	0	308	319	731	18	1376
11				0	0	297	108	297	702
12					0	0	100	44	144
13						0	0	41	41
14							0	0	0
15								0	0
Total									19181
Career Terms									
8									0
9		51	0	252					303
10		25	51	120	249				445
11		155	24	809	119	247			1353
12		72	153	343	800	118	43		1528
13		109	71	634	340	791	20	18	1984
14		32	108	213	627	336	137	9	1462
15		121	32	654	211	620	58	58	1755
16		0	120	332	647	209	108	25	1440
17		0	0	652	329	640	36	46	1703
18		0	0	204	645	325	111	15	1300
Total									13274
Retirement-eligible Terms									
19									1773
20									1216
21									817
22									630
23									456
24									364
25									308
26									193
27									155
28									111
29									101
Total									6124
Grand total									66920

EFFECTIVENESS

After some background calculations on training times and counts of persons who require training during a cohort year (Table 6.22), this submodule uses the results of the previous submodules to estimate the cohort's effectiveness over its entire lifecycle.

The tables in this submodule (and in the next) use only YOS in their accounts. In other words, the tables in this submodule aggregate over all years to end of term of service (YETS) and over all categories of enlistment. Those distinctions were important in the inventory projection (because the EFMP inventory projection models use them). However, they are not needed to estimate either a cohort's effectiveness or its cost.

The measure of effectiveness used in ALEC is the weighted trained-person-year. To estimate this measure, the model first estimates the number of person-years produced by the cohort (Table 6.23). Then the model subtracts time spent in training to estimate the number of trained-person-years (Table 6.24). Finally, the weights are applied to the trained-person-years to get weighted trained-person-years (Table 6.25).

For an explanation of the weighting system, consult Sec. V, "Effectiveness Measures," in *ALEC (Theory and Results)*.

Table 6.18

POTENTIAL REENLISTMENTS ADJUSTED FOR MOVES OUT AND IN

Potential Reenlist-in from Total Reenlist-out		CAREER Movers Out (after CJR)	CAREER Losses from CJR	Retrain Out	CAREER Movers In (after CJR)	Retrain In	Total Reenlist-in	
YOS	TOE6	TOE4					TOE4	TOE6
Second Term								
4	1533	593	543	0	0	1604	0	2297
5	359	139					359	139
6	334	129					334	129
7	0	0					0	0
8	0	0					0	0
9								
10								
11								
12								
13								
14								
15								
Total								
Career Terms								
8	52	255		0	0	52	255	
9	25	122				25	122	
10	156	767				156	767	
11	73	323				73	323	
12	110	488		0	0	110	488	
13	33	144				33	144	
14	122	554				122	554	
15	0	304				0	304	
16	0	540				0	540	
17	0	206				0	206	
18	0	542				0	542	
Total								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
Total								

Table 6.19
REENLISTMENTS DURING YEAR

YOS	Years to ETS							Total
	6	5	4	3	2	1	0	
First Term								
0								
1								
2								
3								
4								
5								
6								
7								
Total								
Second Term								
4	2297		889					3186
5	359		139					497
6	334		129					463
7	0		0					0
8	0		0					0
9								0
10								0
11								0
12								0
13								0
14								0
15								0
Total								4147
Career Terms								
8	52		255					307
9	25		122					147
10	156		767					923
11	73		323					396
12	110		488					599
13	33		144					177
14	122		554					676
15	0		304					304
16	0		540					540
17	0		206					206
18	0		542					542
Total								4815
Retirement-eligible Terms								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
Total								
Grand total								8962

Table 6.20
GAINS DURING YEAR

	Years to ETS								
YOS	6	5	4	3	2	1	0	-1	Total
First Term									
0	0		10000						10000
1									0
2									0
3									0
4									0
5									0
6									0
7									0
Total									10000
Second Term									
4	0		0						0
5									0
6									0
7									0
8									0
9									0
10									0
11									0
12									0
13									0
14									0
15									0
Total									0
Career Terms									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
Total									
Retirement-eligible Terms									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
Total									
Grand total									10000

Table 6.21

ENDING INVENTORY

[illegible]

Table 6.22

TRAINING CHARACTERISTICS

Training Time

Duration of technical school (weeks)	37.8
Cost of technical school (FY85 \$)	11840
Duration of OJT (months)	11.23

Training Time (years)

BMT	0.115
Tech school	0.727

Required Initial Training

	NPS
YOS	Access.
0	10000

Required Training

YOS	All Training NPS	Tech and OJT only			Total Tech & OJT only
		PS with	CAREER Move In	Retrain In	
0	10000				
1					
2					
3					
4		0	1604	0	1604
5					
6					
7					
8				0	0
9					
10					
11					
12				0	0

Table 6.23

ESTIMATION OF PERSON YEARS SERVED
AFTER EACH YOS POINT

YOS	Person Years	Early Release		Person Years after ER
		First Term	Second Term	
0	10000			10000
1	8880			8880
2	8374			8374
3	8047	0		8047
4	5390	0		5390
5	4483	0		4483
6	4024	0		4024
7	3933	0	0	3933
8	3616		0	3616
9	3416		0	3416
10	2744		0	2744
11	2451		0	2451
12	2271		0	2271
13	2201		0	2201
14	2138		0	2138
15	2059		0	2059
16	1980			1980
17	1909			1909
18	1843			1843
19	1773			1773
20	1216			1216
21	817			817
22	630			630
23	456			456
24	364			364
25	308			308
26	193			193
27	155			155
28	111			111
29	101			101
Total 85882				

Table 6.24

ESTIMATION OF TRAINED-PERSON-YEARS

YOS	Person Years	Person-years not working as Trained Person			Trained- Person- Years
		Nonworking trainee			
		BMT	Tech School	OJT Trainee	
0	10000	1154	7269		1577
1	8880			3743	5137
2	8374				8374
3	8047				8047
4	5390		1166		4224
5	4483		0	600	3883
6	4024		0	0	4024
7	3933		0	0	3933
8	3616		0	0	3616
9	3416		0	0	3416
10	2744		0	0	2744
11	2451		0	0	2451
12	2271		0	0	2271
13	2201			0	2201
14	2138				2138
15	2059				2059
16	1980				1980
17	1909				1909
18	1843				1843
19	1773				1773
20	1216				1216
21	817				817
22	630				630
23	456				456
24	364				364
25	308				308
26	193				193
27	155				155
28	111				111
29	101				101
Total	85882	1154	8435	4344	71950
NPV	64524	1109	7948	3935	51531

Table 6.25

ESTIMATION OF WEIGHTED TRAINED-PERSON-YEARS

YOS	Trained- Person- Years (b=0)	Experience Weight	Trained- Person- Years (b=1)	Percent Distribution of Trained-Person-Years by Four-year Intervals
0	1577	1.000	1577	
1	5137	1.078	5539	
2	8374	1.135	9508	
3	8047	1.222	9834	32.2
4	4224	1.293	5462	
5	3883	1.372	5326	
6	4024	1.395	5615	
7	3933	1.488	5852	22.3
8	3616	1.510	5460	
9	3416	1.570	5362	
10	2744	1.588	4356	
11	2451	1.649	4041	17.0
12	2271	1.675	3803	
13	2201	1.761	3875	
14	2138	1.790	3827	
15	2059	1.868	3846	12.0
16	1980	1.902	3765	
17	1909	1.982	3784	
18	1843	2.030	3741	
19	1773	2.115	3749	10.4
20	1216	2.126	2585	
21	817	2.221	1815	
22	630	2.262	1426	
23	456	2.458	1121	
24	364	2.507	913	4.8
25	308	2.531	779	
26	193	2.698	520	
27	155	2.950	457	
28	111	3.070	342	
29	101	3.070	310	1.2
Total	71950		108590	100.0
NPV	51531		73615	

Average experience weight = (NPV weighted)/(NPV unweighted) = 1.429

COST

The estimation of cohort costs concludes ALEC's calculation module. The total cost of the cohort (Table 6.34) equals the sum of

training cost (Table 6.27, estimated using Table 6.26),
support cost (Table 6.28),
pay received by trained persons (Table 6.29),
reenlistment bonuses (Table 6.30),
retirement benefits (Table 6.31, estimated using Table 6.32), and
crossflow fees (Table 6.33).

Sec. VI, "Cost Components," in *ALEC (Theory and Results)* defines each of these costs and explains how ALEC estimates them.

Table 6.26

FACTOR TO ADJUST ANNUAL PAY
FOR MIX OF NPS4 AND NPS6

YOS	Factor
0	0.988081
1	0.992838
2	0.988764

Table 6.27
TRAINING COSTS

YOS	Persons Trained	Cost per Trainee				Total Training Cost (000)
		Recru/BMT	Tech Sch	OJT	Total	
Initial Training						
0	10000	4604	11699	4407	20710	207095
Retraining						
4	1604		14378	5767	20144	32309
5	0		15059	6117	21176	0
6	0		15262	6222	21485	0
7	0		16066	6636	22703	0
8	0		16259	6735	22994	0
9	0		16774	7000	23774	0
10	0		16929	7081	24010	0
11	0		17461	7355	24816	0
12	0		17682	7468	25151	0

Table 6.28

SUPPORT COSTS

YOS	Person Years	Support Cost per Person Year	Total Support Cost (000)
0	10000	7112	71120
1	8880	7112	63155
2	8374	7112	59555
3	8047	7112	57232
4	5390	7112	38334
5	4483	7112	31886
6	4024	7112	28622
7	3933	7112	27968
8	3616	7112	25714
9	3416	7112	24295
10	2744	7112	19512
11	2451	7112	17429
12	2271	7112	16153
13	2201	7112	15655
14	2138	7112	15206
15	2059	7112	14646
16	1980	7112	14080
17	1909	7112	13576
18	1843	7112	13104
19	1773	7112	12608
20	1216	7112	8649
21	817	7112	5812
22	630	7112	4481
23	456	7112	3244
24	364	7112	2589
25	308	7112	2188
26	193	7112	1372
27	155	7112	1103
28	111	7112	793
29	101	7112	718

Table 6.29

TRAINED-PERSON PAY

YOS	Trained- Person- Year	Pay & Allow. per Trained- Person-Year	Total Regular Comp. (000)
0	1577	11772	18564
1	5137	12755	65518
2	8374	13376	112008
3	8047	14559	117160
4	4224	15405	65072
5	3883	16342	63456
6	4024	16622	66894
7	3933	17728	69715
8	3616	17993	65055
9	3416	18701	63883
10	2744	18915	51894
11	2451	19647	48147
12	2271	19951	45313
13	2201	20975	46171
14	2138	21323	45592
15	2059	22252	45823
16	1980	22660	44861
17	1909	23617	45081
18	1843	24187	44565
19	1773	25195	44664
20	1216	25325	30798
21	817	26463	21626
22	630	26955	16984
23	456	29284	13359
24	364	29874	10875
25	308	30155	9276
26	193	32143	6199
27	155	35145	5450
28	111	36572	4077
29	101	36572	3690

Table 6.30

REENLISTMENT BONUSES

YOS	Reenlist for Four Years	Reenlist for Six Years	Total Reenlist- ment Years	Bonus Multiple	Monthly Basic Pay	Nonlevel Payment Reduction Factor	Total Bonus Payment (000)
Zone A							
2							
3	889	2297	17340	2	783	0.975	26459
4	139	359	2706	2	841	0.975	4437
5	129	334	2520	2	908	0.975	4463
Zone B							
6	0	0	0	0	920	1.000	0
7	255	52	1330	0	992	0.980	0
8	122	25	636	0	1005	0.980	0
9	767	156	4003	0	1056	0.980	0
Zone C							
10	323	73	1729	0	1068	0.979	0
11	488	110	2614	0	1108	0.979	0
12	144	33	773	0	1128	0.979	0
13	554	122	2949	0	1214	0.979	0

Table 6.31

RETIREMENT BENEFITS

YOS	Persons Retiring	Monthly Basic Pay at Ret.	Fraction Basic Pay Received	Discounted Years of Retirement	Total Retirement Benefits (000)
19	557	1505	0.500	20.5	103218
20	399	1513	0.525	20.4	77399
21	187	1591	0.550	20.2	39613
22	174	1624	0.575	20.0	38881
23	92	1793	0.600	19.7	23492
24	56	1832	0.625	19.5	15142
25	115	1851	0.650	19.3	31972
26	38	1982	0.675	19.1	11574
27	44	2209	0.700	18.8	15217
28	11	2303	0.725	18.6	3940
29	101	2303	0.750	18.3	38270

Table 6.32

DISCOUNTED YEARS OF RETIREMENT
(Used in Estimating Retirement Benefits)

Biological Age of Person Retired Person (yrs.)	YOS at Start of Year in Which Retirement Occurs						
	19	20	21	22	23	24	25
39	0.98						
40	0.95	0.98					
41	0.91	0.95	0.98				
42	0.87	0.91	0.95	0.98			
43	0.84	0.87	0.91	0.95	0.98		
44	0.81	0.84	0.87	0.91	0.95	0.98	
45	0.77	0.81	0.84	0.87	0.91	0.95	0.98
46	0.74	0.77	0.81	0.84	0.87	0.91	0.95
47	0.71	0.74	0.77	0.81	0.84	0.87	0.91
48	0.69	0.71	0.74	0.77	0.81	0.84	0.87
49	0.66	0.69	0.71	0.74	0.77	0.81	0.84
50	5.98	6.23	6.48	6.75	7.02	7.31	7.61
60	3.48	3.63	3.77	3.93	4.09	4.26	4.43
70	1.64	1.71	1.78	1.85	1.93	2.00	2.09
80	0.46	0.47	0.49	0.51	0.53	0.56	0.58
90	0.04	0.04	0.05	0.05	0.05	0.05	0.05
Total	20.53957	20.35365	20.16014	19.95874	19.74911	19.53093	19.30384

Table 6.33

CROSSFLOW FEES

YOS	Inflow	Fee Paid per Inflow	Total Inflow Fees (000)	Outflow	Fee Received per Outflow	Total Outflow Fee (000)	Net Crossflow Fees Paid (000)
0							
1							
2							
3							
career 4	1604	36000		543	16400		
retrain 4	0	-16000	57740	0	16400	8908	48832
5							
6							
7							
8		0	-75500	0	-4700	0	0
9							
10							
11							
12	0	0	-126400	0	-49000	0	0
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
Total							
NPV							

Table 6.34

SUMMARY OF PERSONNEL COSTS (000)

YOS	Training	Support	Pay	Reen. Bonus	Ret. Benefits	Crossflow Fees	Total
0	207095	71120	18564				296779
1		63155	65518				128673
2		59555	112008	0			171563
3		57232	117160	26459			200851
4	32309	38334	65072	4437		48832	188985
5	0	31886	63456	4463			99805
6	0	28622	66894	0			95516
7	0	27968	69715	0			97683
8	0	25714	65055	0		0	90769
9	0	24295	63883	0			88178
10	0	19512	51894	0			71406
11	0	17429	48147	0			65576
12	0	16153	45313	0		0	61466
13		15655	46171	0			61826
14		15206	45592				60798
15		14646	45823				60469
16		14080	44861				58942
17		13576	45081				58656
18		13104	44565				57669
19		12608	44664		103218		160490
20		8649	30798		77399		116845
21		5812	21626		39613		67051
22		4481	16984		38881		60345
23		3244	13359		23492		40095
24		2589	10875		15142		28606
25		2188	9276		31972		43435
26		1372	6199		11574		19145
27		1103	5450		15217		21770
28		793	4077		3940		8810
29		718	3690		38270		42677
Total	239405	610796	1291770	32359	398717	48832	2624878
NPV	225686	458892	875261	29791	162090	40137	1791858

VII. OUTPUT MODULE

This module collects all the results from the calculation module that are needed to produce the ALEC REPORT. Those results are presented in only four tables. The tables record summary information on the force distribution over the cohort's lifecycle (Table 7.1), costs over the cohort's lifecycle (Table 7.2), constraints on choosing management actions (Table 7.3), and cost per trained-person-year (Table 7.4).

The first three of these tables are prepared using the following spreadsheet technique: Formulas in the plan column automatically record the results of the calculation module when the spreadsheet is recalculated. However, the calculation module is first run for the reference situation. If no step was taken, then the reference case results would be replaced by the plan's results when the plan was analyzed. To avoid this loss of information, after the reference situation analysis the (reference situation) results in the plan column are moved (by a macro) to the reference column. Then, after the plan has been analyzed, and its results correctly end up in the plan column, the change column is calculated by a spreadsheet formula already in that column.

The fourth table is derived from the first and second, using ordinary spreadsheet formulas.

Table 7.1
FORCE DISTRIBUTIONS

YOS	Trained-Person-Years		
	Reference	Plan	Change
0-3	23135	23135	0
4-7	11548	16064	4516
8-11	7560	12226	4665
12-15	6060	8670	2610
16-19	5227	7504	2276
20-24	2423	3484	1060
25-29	604	868	264
Total	56558	71950	15392
NPV (b=0)	41815	51531	9716
Weighted NPV (b=1)	57799	73615	15816

Table 7.2
COHORT COST

Cost Component	NPV of Costs by Component (Thousands of FY84 \$)		
	Reference	Plan	Change
Trained-person pay	686830	875261	188431
Support	385613	458892	73279
Training cost	214792	225686	10894
Retirement	112754	162090	49336
Reenlist bonus	0	29791	29791
Crossflow fees	17271	40137	22865
Total	1417261	1791858	374597

Table 7.3

GUIDELINES FOR CHOOSING MANAGEMENT ACTIONS

Item	Reference	Plan
Max. early rel., term 1	5400	4961
Max. early rel., term 2	912	1442
Max. retrain-out, YOS4	845	1583
Max. retrain-out, YOS8	591	307
Max. retrain-out, YOS12	464	599
CJR own binds at	1852	2543
CJR other binds at	946	1604

Table 7.4

COST PER TRAINED-PERSON-YEAR
(FY84 \$)

Cost Component	Reference	Plan	Planned Change
Trained-person pay	16425	16985	19394
Support	9222	8905	7542
Training cost	5137	4380	1121
Retirement	2697	3145	5078
Reenlist bonus	0	578	3066
Crossflow fees	413	779	2353
Total	33894	34773	38555

Appendix A

CEMPGS AND SECTORS OF THE ENLISTED FORCE

This appendix defines the parts of the enlisted force for which ALEC's input data have been assembled. Those parts are called Chief Enlisted Manager Progression Groups (CEMPGs); each contains, on average, about 1 percent of the enlisted force.

This appendix then lists the data. The listings are necessary because the model's results are no better than the data on which they are based. The data have been assembled from EFMP research databases, which in turn were derived from Air Force operational databases. Considerable effort has been expended to make the data as complete and as accurate as possible. However, ALEC has been primarily a model building effort and only secondarily a database preparation effort; so the database is not complete, and it may contain errors. Users of ALEC should examine the input data for a given CEMPG before accepting the model's output for that specialty.

CEMPGs for which data are missing in ALEC's current database have been marked with an asterisk in the listing of CEMPG descriptions. ALEC has been programmed not to accept a request to analyze these CEMPGs, because any results that ALEC produced for them would be seriously misleading.

Users of ALEC who want to draw conclusions about the excluded CEMPGs with the current database should find a specialty that has similar behavioral characteristics (training time, loss rates, etc.) and use the results for that stand-in specialty.

The problem CEMPGs are 23 percent of all CEMPGs, but (because the problem CEMPGs tend to be small) they contain only 5 percent of the enlisted force. Future databases prepared for ALEC should assemble the missing data so that all specialties can be analyzed.

CHIEF ENLISTED MANAGER GROUPS

Air Force enlisted personnel work in many hundreds of job specialties. At the most detailed level, those specialties are identified by Air Force Specialty Codes that can have as many as seven digits.

For ALEC's lifecycle analyses, we combine those detailed specialties into groups whose normal career progression leads to a common chief enlisted manager. These groups are called Chief Enlisted Manager Progression Groups. They are named by the initial three digits of their chief enlisted manager's AFSC. Often (but not always) all the AFSCs in a CEMPG have those same three initial digits.

The CEMPGs in ALEC's current database are defined using the AFSCs that existed at the end of FY84 (September 30, 1984), and the data reflect characteristics of the enlisted force at that time. Ideally, of course, ALEC should be run with the latest available data. However, although AFSC definitions and characteristics often change from year to year, most CEMPGs are aggregations of a sufficient number of AFSCs that the characteristics should remain fairly stable over time.

SECTORS OF THE ENLISTED FORCE

To estimate support costs, ALEC distinguishes between support and operations CEMPGs. The distinction is that the level of personnel in the former depends on the total size of the enlisted force that must be supported, while the level of personnel in the latter depends upon the missions that the Air Force must be ready to perform.

Then, for overview analyses of management actions, such as those in *ALEC (Theory and Results)*, the operations CEMPGs are divided into three groups by the duration of formal training (BMT plus technical school).

The result is a classification of the entire enlisted force into four sectors:

- Support
- Low training
- Moderate training
- High training

CEMPGs whose personnel levels depend on the total number of enlisted persons in the enlisted force are in the support sector.

Nonsupport CEMPGs whose average duration of formal training is less than or equal to one-fourth of a year (13 weeks) are in the low training sector.

Nonsupport CEMPGs whose average duration of formal training is more than one-fourth of a year (13 weeks) but less than or equal to one-half a year (26 weeks) are in the moderate training sector.

Nonsupport CEMPGs whose average duration of formal training is more than one-half a year (26 weeks) are in the high training sector.

CHARACTERISTICS OF CEMPGS AND SECTORS

The rest of this appendix lists the data used by ALEC. At the start of an ALEC run, the user selects the sector or CEMPG to be analyzed, then the model reads the data for that specialty into the computer from the data disc.

The numbers in the database are exactly the same as are given in the following listings. So if the data are wrong, or inappropriate for a lifecycle analysis, then the model will give wrong answers. Making sure that the inputs are reasonable is the responsibility of ALEC users. Where the data do not make sense, ALEC should not be used to analyze the CEMPG.

A good way to check the data is to compare a specialty's characteristics with the average characteristics of the sector in which the specialty falls. Then try and understand why the specialty characteristics differ from the average. For example, if the specialty's training time in the database is 20 percent higher than average, does this make sense given the nature of the specialty?

The data are grouped under the following headings:

Brief description

Inventory on September 30, 1984

Training characteristics and bonus multiples in FY84

Loss rates, first term, 4-year TOE

Loss rates, first term, 6-year TOE

Loss rates, second term
Loss rates, career terms
Loss rates, retirement terms, YOS = 19-24
Loss rates, retirement terms, YOS = 25-29
Extension rates
CAREER Program coefficients

The list of CEMPGs reflects that enlisted force specialty structure as of the end of fiscal year 1984, as do the inventory counts, training characteristics, and bonus multiples. The bonus multiples are included in the database to guide users in their choice of plans. They are not used by the ALEC model, rather ALEC analyzes only bonus plans specified by the user.

The loss and extension rates are the constant terms in ALEC's loss and extension rate equations. They are the loss and extension rates that would occur if no reenlistment bonuses are offered. If the user specifies some reenlistment bonuses, then ALEC revises the loss and extension rates in the database using the behavioral coefficients in Sec. IV of *ALEC (Theory and Results)*.

CEMPG DESCRIPTIONS

An asterisk after the CEMPG 3-digit code indicates that ALEC will not accept a request to analyze the CEMPG, because the data in ALEC's database are incomplete. The CEMPGs with the asterisk are missing training costs and/or loss rates and/or extension rates.

All the other CEMPGs can be analyzed using the existing database.

CEMPG	DESCRIPTION
	Support Sector
472	Vehicle Maintenance
602	Traffic
603	Vehicle Operations
605	Air Transportation
611	Services
612	Subsistence

622	Food Service
645	Supply
651*	Contracting
661	Logistics Plans
672	Financial
673*	Auditing
691	Cost Management Analysis
701*	Chapel Management
702	Administration
703	Reprographic
705	Legal Services
732	Personnel Resource
733	Manpower Resource
734	Social Actions
741	Recreation Services
742	Open Mess Management
753	Combat Arms Training and Maintenance

791	Public Affairs
902	Medical Service
905	Pharmacy
906	Medical Administration
912	Optometry
914	Mental Health
915*	Medical Material
926*	Diet Therapy
981	Dental

Low Training Sector

100*	First Sergeant
116*	Airborne Communications Systems
121	Survival Training
122	Aircrew Life Support
242	Disaster Preparedness
271	Air Operations
274	Command and Control
276	Aerospace Control and Warning System
277	Space Systems Operations
296*	Communications-Electronics Programs
297*	Radio Frequency
462	Aircraft Armament
511	Computer Systems
551	Pavements and Construction Equipment
552	Structural
554	CE Resources
555	Production Control
566	Sanitation
571	Fire Protection
591	Marine
631	Fuel
811	Security Police

871	Band
872*	Instrumentalist
911*	Aerospace Physiology
990*	Other Reporting Identifiers
995	Other Special Duty Identifiers
996	Other Special Duty Identifiers
997*	Other Special Duty Identifiers

Moderate Training Sector

111	Defensive Aerial Gunner
112*	Inflight Refueling
113	Flight Engineer
114*	Aircraft Loadmaster
115	Pararescue/Recovery
205	Electronic Intelligence Operations
206	Intelligence Operations
209	Defensive C3CM
222*	Geodetic
231	Audiovisual
241*	Safety
251	Weather
272	Air Traffic Control
275	Tactical Air Command and Control
291	Telecommunications Operations
391*	Maintenance Systems Analysis
392	Maintenance Scheduling
404	Photographic Systems Maintenance
427	Fabrication
432	Aircraft Maintenance
445	Missile Facilities
461	Munitions Maintenance
463	Nuclear Weapons
542	Electrical
545	Mechanical
553	Engineering Assistant
821	Special Investigations
903	Radiologic
907	Bioenvironmental Engineering
908*	Environmental Medicine
913*	Biomedical Therapy
918	Biomedical Equipment Maintenance
924	Medical Lab

High Training Sector

202	Radio Communications Analyst
203*	Linguist/Interrogator
207	Communication Collection System
208	Cryptologic Linguist
273	Combat Control

301	Communication-Electronics Systems
307	Telecommunications Systems Control
316	Missile Electronic Maintenance
324	Precision Measuring Equipment
329	Avionics
341	Training Devices
362	Telephone/Cable and Antenna Maintenance
443*	Missile Maintenance
464	Explosive Ordnance Disposal
919*	Orthotic
982*	Dental Lab
991*	Other Reporting Identifiers

INVENTORY OF ENLISTED PERSONNEL: SEPTEMBER 30, 1984

SG	Sector group
CEMPG	Chief enlisted manager progression group
F4	First term, 4-year Term of Enlistment (TOE)
F6	First term, 6-year Term of Enlistment (TOE)
SEC	Second term
CAR	Career terms
RET	Retirement eligible
TOTAL	Total inventory

SG	CEMPG	F4	F6	SEC	CAR	RET	TOTAL
----	-------	----	----	-----	-----	-----	-------

Sector Averages

S	.	53207	4546	26413	34634	9525	128325
L	.	48547	12709	21805	25948	6863	115872
M	.	57494	4953	39939	40654	9483	152563
H	.	34670	6246	19517	17815	5243	83491

Support Sector

S	472	2490	175	1164	1308	322	5459
S	602	1503	55	563	774	137	3032
S	603	3130	391	974	834	181	5510
S	605	3023	59	1198	1449	258	5987
S	611	826	100	353	555	135	1969
S	612	333	26	142	211	70	782
S	622	2643	136	588	823	277	4467
S	645	10400	1311	4974	6852	1893	25430
S	651	423	21	471	497	153	1565
S	661	68	2	229	448	226	973
S	672	1870	171	1391	1517	436	5385
S	673	0	0	0	3	3	6
S	691	56	5	169	161	68	459
S	701	276	18	148	197	82	721
S	702	10382	1159	5592	7596	1855	26584
S	703	333	19	114	179	61	706
S	705	85	4	213	397	118	817
S	732	3637	253	2585	4468	1427	12370
S	733	70	10	269	544	237	1130
S	734	55	6	197	289	119	666
S	741	516	59	236	375	119	1505
S	742	43	6	103	205	108	465
S	753	334	30	203	243	43	853

SG	CEMPG	F4	F6	SEC	CAR	RET	TOTAL
S	791	375	24	306	433	114	1252
S	902	5357	118	2135	2126	492	10228
S	905	382	27	220	169	48	846
S	906	1773	201	743	782	258	3757
S	912	67	8	49	78	3	205
S	914	369	11	115	132	35	662
S	915	537	13	291	324	89	1264
S	926	377	4	138	150	26	695
S	981	1474	114	540	515	132	2775

Low Training Sector

L	100	0	0	2	889	1072	1663
L	116	115	16	275	341	85	662
L	121	144	13	96	98	20	371
L	122	1227	87	484	494	152	2539
L	142	0	6	186	66	91	676
L	171	2364	157	126	1127	326	3600
L	174	0	8	297	809	274	2312
L	176	0	10	68	1343	349	3555
L	177	47	0	40	25	8	135
L	196	0	0	76	144	112	447
L	200	0	0	0	46	19	74
L	201	0	0	1247	1534	436	12901
L	202	0	12	1297	1827	474	7171
L	203	0	0	0	136	184	4366
L	204	0	0	0	1124	249	5395
L	205	0	0	0	132	43	609
L	206	0	0	0	624	247	1271
L	207	0	0	11	143	81	1739
L	208	0	0	44	1666	207	5911
L	209	0	0	18	37	14	125
L	210	0	0	167	1354	244	6960
L	211	0	0	611	9111	956	39305
L	212	0	0	112	117	60	803
L	213	0	0	8	120	55	230
L	214	0	0	80	99	36	462
L	215	0	0	126	343	27	5877
L	216	0	0	0	2094	616	3985
L	217	0	0	403	1114	381	2469
L	218	0	0	61	117	65	259

Low Training Sector

L	219	0	0	192	127	58	468
L	220	0	0	418	325	131	1038
L	221	0	0	808	1389	530	3001
L	222	0	0	935	774	320	2388

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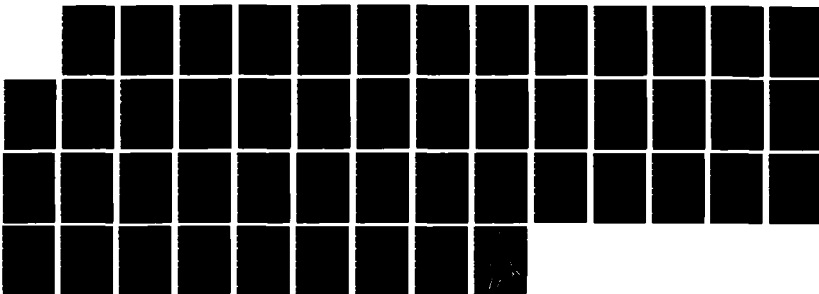
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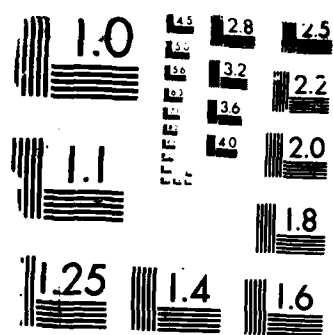
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SG	CEMPG	F4	F6	SEC	CAR	RET	TOTAL
M	115	179	18	137	93	10	437
M	205	258	58	214	119	46	695
M	206	849	145	882	685	244	2805
M	209	123	17	44	46	13	243
M	222	17	0	51	36	12	116
M	231	1141	154	556	948	249	3048
M	241	16	0	199	321	107	643
M	251	982	153	898	794	232	3059
M	272	1929	238	1799	1652	419	6037
M	275	376	46	153	144	34	753
M	291	4089	546	1865	2110	694	9304
M	391	404	24	187	442	112	1169
M	392	509	34	356	833	207	1939
M	404	410	15	200	184	44	853
M	427	3771	230	2359	2144	350	8854
M	432	28730	1593	20670	20725	4247	75965
M	445	651	35	382	314	31	1413
M	461	3225	931	1980	1656	330	8122
M	463	513	135	409	311	85	1453
M	542	2594	82	1239	1316	240	5471
M	545	2313	112	1213	1109	182	4929
M	553	507	67	364	360	91	1389
M	821	25	8	228	464	148	873
M	903	650	99	174	217	43	1183
M	907	307	31	207	180	63	788
M	908	496	27	153	213	60	949
M	913	170	3	71	99	29	372
M	918	263	16	156	137	44	616
M	924	1153	132	440	387	78	2190

High Training Sector

H	202	636	132	496	421	127	1812
H	203	1	3	7	29	25	65
H	207	1560	387	648	545	201	3341
H	208	937	1567	923	613	151	4191
H	273	128	7	101	70	20	326
H	301	10889	1408	5919	5916	1916	26048
H	307	924	112	427	620	153	2236
H	316	1261	119	901	899	196	3376
H	324	1241	146	583	504	154	2628
H	329	12396	1660	6921	5568	1351	27896
H	341	1311	106	466	553	172	2608
H	362	1930	183	998	933	243	4287
H	443	789	30	471	482	51	1823
H	464	148	374	255	232	90	1099
H	919	24	0	6	15	5	50
H	982	367	7	121	143	30	668
H	991	128	5	274	272	358	1037

TRAINING CHARACTERISTICS AND BONUS MULTIPLES

SG Sector group
CEMPG Chief enlisted manager progression group
TRAIN Length of formal training (BMT and Technical) in weeks
COST Cost of formal training, in FY84 dollars
OJT Length of OJT period, in months
A Zone A bonus multiple, in FY84
B Zone B bonus multiple, in FY84
C Zone C bonus multiple, in FY84

SG	CEMPG	TRAIN	COST	OJT	A	B	C
Sector Averages							
S	.	11.9	8313	9.39	0.0	0.0	0.0
L	.	11.0	7062	9.48	0.2	0.0	0.0
M	.	15.5	10108	10.77	0.5	0.5	0.4
H	.	43.8	16444	11.23	1.3	1.1	0.6

Support Sector

S	472	16.1	11332	10	0.0	0.0	0.0
S	602	13.1	7691	10	0.0	0.0	0.0
S	603	6.0	4604	6	0.0	0.0	0.0
S	605	11.0	6677	9	0.0	0.0	0.0
S	611	6.0	4604	7	0.0	0.0	0.0
S	612	6.0	4578	5	0.0	0.0	0.0
S	622	14.8	9924	10	0.0	0.0	0.0
S	645	11.1	9946	9	0.0	0.0	0.0
S	651	10.0	6564	10	0.0	0.0	0.0
S	661	10.6	8052	10	0.5	0.0	0.0
S	672	14.3	8376	10	0.0	0.0	0.0
S	673	6.0	4604	10	0.0	0.0	0.0
S	691	15.4	9985	10	0.0	0.0	0.0
S	701	12.5	8244	11	0.0	0.0	0.0
S	702	11.9	7588	10	0.0	0.0	0.0
S	703	21.4	9907	9	0.0	0.0	0.0
S	705	12.0	8711	8	0.0	0.0	0.0
S	732	13.4	8437	11	0.0	0.0	0.0
S	733	16.0	10722	10	0.0	0.0	0.0
S	734	14.0	9333	10	0.0	0.0	0.0
S	741	6.0	4604	8	0.0	0.0	0.0
S	742	6.0	4604	16	0.0	0.0	0.0
S	753	13.9	8513	8	0.0	0.0	0.0

SG	CEMPG	TRAIN	COST	OJT	A	B	C
S	791	15.7	14288	10	0.0	0.0	0.0
S	902	12.8	8275	8	0.0	0.0	0.0
S	905	18.0	10767	11	0.0	0.0	0.0
S	906	12.0	7882	13	0.0	0.0	0.0
S	912	15.0	9275	10	0.0	0.0	0.0
S	914	9.3	6582	10	0.0	0.0	0.0
S	915	11.8	7799	12	0.0	0.0	0.0
S	926	0.0	0	8	0.0	0.0	0.0
S	981	15.0	10688	9	0.0	0.0	0.0

Low Training Sector

L	100	0.0	0	0	0.0	0.0	0.0
L	116	0.0	0	10	1.0	0.0	0.0
L	121	7.5	6227	13	0.0	1.0	0.0
L	122	11.3	7942	8	0.0	0.0	0.0
L	242	12.7	10286	10	1.0	0.0	0.0
L	271	6.0	4604	11	0.0	0.0	0.0
L	274	12.2	9577	9	0.0	0.0	0.0
L	276	11.2	8692	11	0.0	0.0	0.0
L	277	6.0	4604	7	2.0	0.0	0.0
L	296	10.0	7249	10	0.0	1.0	0.0
L	297	6.0	4604	10	0.0	1.0	0.0
L	462	12.9	7138	10	0.0	0.0	0.0
L	511	12.6	9955	9	0.9	0.5	0.8
L	551	12.1	8593	10	0.0	0.0	0.0
L	552	11.6	7991	11	0.1	0.0	0.0
L	554	9.6	6983	8	0.0	0.0	0.0
L	555	10.6	7605	10	0.0	0.0	0.0
L	566	12.6	8650	10	0.0	0.0	0.0
L	571	12.2	8894	10	0.0	0.0	0.0
L	591	5.8	4430	10	0.0	0.0	0.0
L	631	11.2	7674	7	0.0	0.0	0.0
L	811	12.5	7465	9	0.4	0.0	0.0
L	871	6.0	4604	10	0.0	0.0	0.0
L	872	0.0	0	10	0.0	0.0	0.0
L	911	9.8	6569	9	0.0	0.0	0.0
L	990	0.0	0	10	0.0	0.0	0.0
L	995	0.9	693	10	0.0	0.0	0.0
L	996	8.8	6944	11	0.0	0.0	0.0
L	997	0.0	0	10	0.0	0.0	0.0

Moderate Training Sector

M	111	24.5	93962	10	0.0	0.0	0.0
M	112	19.4	49677	7	0.0	0.0	0.0
M	113	20.5	18277	10	1.0	0.0	0.0
M	114	17.2	6896	10	0.0	0.0	0.0
M	115	13.6	16472	10	2.0	0.0	0.0

SG	CEMPG	TRAIN	COST	OJT	A	B	C
M	205	24.0	14740	7	2.0	1.0	1.0
M	206	24.9	12678	11	0.7	0.3	0.0
M	209	19.0	12373	9	1.0	1.0	1.0
M	222	24.4	8448	10	1.0	0.0	0.5
M	231	15.9	10349	10	0.0	0.0	0.0
M	241	14.8	10060	10	1.0	0.0	0.0
M	251	17.4	10650	10	1.0	1.0	1.0
M	272	22.0	13964	11	3.0	2.0	2.0
M	275	20.0	11215	11	1.0	1.0	0.0
M	291	14.6	9223	9	0.0	0.0	0.0
M	391	13.8	9525	21	0.0	0.0	0.0
M	392	14.0	9428	7	0.0	0.0	0.0
M	404	17.3	8556	13	0.0	0.0	0.0
M	427	16.6	11616	11	0.4	0.0	0.0
M	432	13.3	8326	11	0.6	0.7	0.6
M	445	20.1	13103	10	1.2	1.1	1.1
M	461	18.7	12472	11	0.0	0.0	0.0
M	463	24.4	12390	9	0.0	0.0	1.0
M	542	14.0	9294	11	0.5	0.0	0.0
M	545	15.1	10007	14	0.7	0.0	0.0
M	553	17.0	11416	13	1.0	1.0	1.0
M	821	18.3	10232	10	0.0	0.0	0.0
M	903	20.2	10671	10	0.0	0.0	0.0
M	907	17.4	9957	10	0.0	0.0	0.0
M	908	17.6	10141	8	0.0	0.0	0.0
M	913	17.9	11320	11	0.0	0.0	0.0
M	918	22.3	16161	9	0.0	0.0	0.0
M	924	24.0	16976	7	0.0	0.0	0.0

High Training Sector

H	202	47.6	11914	14	1.0	1.0	0.0
H	203	53.0	23608	10	0.0	0.0	1.0
H	207	26.6	17279	9	0.0	0.4	0.4
H	208	68.8	35036	10	2.0	2.0	2.0
H	273	29.6	30482	10	3.0	2.0	3.0
H	301	43.5	15330	12	1.3	1.0	0.4
H	307	43.2	14532	11	2.0	2.0	0.0
H	316	43.7	14316	11	1.5	0.8	0.1
H	324	37.7	22678	10	0.0	0.0	0.0
H	329	47.3	14414	12	1.8	1.6	0.9
H	341	39.6	12758	11	0.0	0.0	0.0
H	362	30.0	13166	10	0.0	0.0	0.0
H	443	26.3	13271	10	0.0	0.1	0.0
H	464	27.4	26482	7	1.0	0.5	0.5
H	919	56.0	30741	10	0.0	0.0	0.0
H	982	30.0	19354	8	0.0	0.0	0.0
H	991	34.4	16372	12	1.1	0.5	0.0

LOSS RATES: FIRST TERM, 4-YEAR TOE

SG	Sector group
CEMPG	Chief enlisted manager progression group
LF4Y0	Loss rate: first term, 4-year TOE, YOS = 0
LF4Y1	Loss rate: first term, 4-year TOE, YOS = 1
LF4Y2	Loss rate: first term, 4-year TOE, YOS = 2
LF4Y3	Loss rate: first term, 4-year TOE, YOS = 3
LF4Y4	Loss rate: first term, 4-year TOE, YOS = 4
LF4Y5	Loss rate: first term, 4-year TOE, YOS = 5

SG	CEMPG	LF4Y0	LF4Y1	LF4Y2	LF4Y3	LF4Y4	LF4Y5
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Sector Averages

S	.	0.127	0.092	0.075	0.364	0.324	0.401
L	.	0.128	0.105	0.087	0.429	0.347	0.431
M	.	0.126	0.085	0.068	0.455	0.360	0.446
H	.	0.112	0.057	0.039	0.509	0.395	0.446

Support Sector

S	472	0.128	0.109	0.091	0.467	0.391	0.465
S	602	0.126	0.108	0.090	0.363	0.337	0.424
S	603	0.137	0.112	0.094	0.380	0.306	0.385
S	605	0.134	0.110	0.092	0.398	0.353	0.444
S	611	0.130	0.096	0.078	0.378	0.366	0.461
S	612	0.128	0.097	0.079	0.383	0.366	0.039
S	622	0.131	0.132	0.114	0.369	0.337	0.424
S	645	0.127	0.079	0.061	0.326	0.290	0.355
S	651	0.123	0.118	0.100	0.419	0.288	0.362
S	661	0.000	0.000	0.011	0.343	0.306	0.385
S	672	0.119	0.062	0.044	0.419	0.345	0.434
S	673	0.000	0.000	0.000	0.000	0.000	0.000
S	691	0.000	0.124	0.106	0.329	0.311	0.392
S	701	0.128	0.086	0.068	0.313	0.303	0.381
S	702	0.131	0.092	0.074	0.313	0.308	0.387
S	703	0.123	0.087	0.069	0.313	0.303	0.381
S	705	0.131	0.092	0.074	0.313	0.279	0.352
S	732	0.115	0.070	0.056	0.298	0.310	0.390
S	733	0.000	0.000	0.057	0.300	0.288	0.362
S	734	0.000	0.056	0.000	0.300	0.292	0.367
S	741	0.128	0.159	0.141	0.248	0.317	0.400
S	742	0.128	0.159	0.141	0.245	0.317	0.400
S	753	0.122	0.071	0.053	0.403	0.291	0.362

SG	CEMPG	LF4Y0	LF4Y1	LF4Y2	LF4Y3	LF4Y4	LF4Y5
S	791	0.113	0.132	0.114	0.432	0.324	0.284
S	902	0.126	0.089	0.071	0.423	0.340	0.444
S	905	0.121	0.084	0.066	0.421	0.365	0.460
S	906	0.127	0.091	0.073	0.402	0.354	0.446
S	912	0.123	0.096	0.078	0.482	0.000	0.000
S	914	0.119	0.096	0.078	0.482	0.185	0.000
S	915	0.123	0.100	0.082	0.457	0.388	0.489
S	926	0.127	0.103	0.085	0.410	0.373	0.470
S	981	0.122	0.070	0.052	0.470	0.424	0.533

Low Training Sector

L	100	0.000	0.000	0.000	0.000	0.000	0.000
L	116	0.114	0.000	0.102	0.493	0.382	0.480
L	121	0.106	0.050	0.032	0.400	0.392	0.000
L	122	0.125	0.065	0.047	0.399	0.392	0.493
L	242	0.133	0.000	0.063	0.352	0.355	0.447
L	271	0.130	0.090	0.072	0.320	0.379	0.477
L	274	0.125	0.088	0.070	0.410	0.379	0.477
L	276	0.125	0.086	0.068	0.461	0.399	0.502
L	277	0.122	0.084	0.066	0.503	0.385	0.484
L	296	0.000	0.000	0.000	0.369	0.326	0.411
L	297	0.000	0.000	0.000	0.000	0.000	0.000
L	462	0.132	0.087	0.069	0.440	0.359	0.452
L	511	0.110	0.057	0.039	0.586	0.397	0.500
L	551	0.135	0.110	0.092	0.502	0.405	0.510
L	552	0.130	0.111	0.093	0.497	0.408	0.514
L	554	0.123	0.109	0.091	0.490	0.405	0.000
L	555	0.133	0.110	0.092	0.490	0.388	0.488
L	566	0.129	0.089	0.071	0.461	0.379	0.476
L	571	0.125	0.092	0.074	0.504	0.400	0.503
L	591	0.079	0.048	0.030	0.178	0.345	0.435
L	631	0.130	0.136	0.118	0.415	0.361	0.455
L	811	0.131	0.126	0.108	0.456	0.373	0.470
L	871	0.129	0.093	0.075	0.452	0.379	0.477
L	872	0.129	0.093	0.000	0.452	0.000	0.000
L	911	0.119	0.097	0.079	0.482	0.388	0.489
L	990	0.125	0.079	0.061	0.056	0.029	0.030
L	995	0.072	0.070	0.052	0.658	0.219	0.112
L	996	0.105	0.076	0.061	0.634	0.220	0.277
L	997	0.000	0.000	0.060	0.659	0.220	0.277

Moderate Training Sector

M	111	0.121	0.116	0.098	0.493	0.382	0.480
M	112	0.123	0.119	0.101	0.493	0.382	0.000
M	113	0.034	0.032	0.098	0.493	0.387	0.487
M	114	0.128	0.118	0.100	0.494	0.381	0.479
M	115	0.116	0.111	0.093	0.493	0.382	0.480

SG	CEMPG	LF4Y0	LF4Y1	LF4Y2	LF4Y3	LF4Y4	LF4Y5
M	205	0.114	0.059	0.041	0.435	0.413	0.519
M	206	0.116	0.060	0.042	0.437	0.413	0.520
M	209	0.108	0.056	0.038	0.428	0.413	0.520
M	222	0.115	0.000	0.000	0.462	0.350	0.441
M	231	0.124	0.087	0.069	0.398	0.394	0.414
M	241	0.000	0.000	0.000	0.352	0.355	0.447
M	251	0.112	0.070	0.052	0.476	0.389	0.490
M	272	0.116	0.079	0.061	0.646	0.382	0.481
M	275	0.116	0.079	0.061	0.550	0.385	0.484
M	291	0.125	0.066	0.048	0.364	0.327	0.412
M	391	0.116	0.074	0.056	0.419	0.296	0.372
M	392	0.114	0.075	0.057	0.426	0.313	0.393
M	404	0.115	0.069	0.051	0.470	0.347	0.240
M	427	0.133	0.094	0.076	0.446	0.364	0.458
M	432	0.132	0.091	0.073	0.457	0.349	0.434
M	445	0.080	0.101	0.083	0.524	0.259	0.376
M	461	0.134	0.087	0.069	0.387	0.342	0.430
M	463	0.124	0.080	0.062	0.546	0.351	0.442
M	542	0.124	0.070	0.052	0.452	0.443	0.558
M	545	0.124	0.069	0.051	0.515	0.443	0.558
M	553	0.108	0.099	0.081	0.491	0.405	0.510
M	821	0.000	0.000	0.000	0.424	0.346	0.436
M	903	0.117	0.083	0.066	0.498	0.365	0.460
M	907	0.118	0.082	0.064	0.419	0.365	0.460
M	908	0.121	0.085	0.067	0.422	0.365	0.460
M	913	0.114	0.091	0.073	0.482	0.302	0.000
M	918	0.107	0.084	0.066	0.482	0.388	0.489
M	924	0.111	0.093	0.075	0.399	0.358	0.449

High Training Sector

H	202	0.114	0.059	0.041	0.424	0.413	0.520
H	203	0.000	0.000	0.000	0.000	0.413	0.000
H	207	0.127	0.070	0.052	0.409	0.413	0.520
H	208	0.116	0.060	0.042	0.432	0.413	0.302
H	273	0.118	0.081	0.063	0.503	0.385	0.484
H	301	0.111	0.044	0.026	0.527	0.429	0.530
H	307	0.112	0.046	0.028	0.481	0.415	0.523
H	316	0.091	0.058	0.041	0.560	0.303	0.231
H	324	0.106	0.055	0.037	0.540	0.399	0.502
H	329	0.111	0.059	0.041	0.512	0.397	0.426
H	341	0.111	0.065	0.047	0.506	0.335	0.422
H	362	0.123	0.075	0.057	0.534	0.306	0.301
H	443	0.107	0.107	0.089	0.475	0.299	0.405
H	464	0.132	0.085	0.067	0.432	0.351	0.442
H	919	0.118	0.095	0.077	0.482	0.000	0.000
H	982	0.118	0.066	0.048	0.459	0.424	0.000
H	991	0.120	0.054	0.031	0.525	0.117	0.147

LOSS RATES: FIRST TERM, 6-YEAR TOE

SG	Sector group
CEMPG	Chief enlisted manager progression group
LF6Y0	Loss rate: first term, 6-year TOE, YOS = 0
LF6Y1	Loss rate: first term, 6-year TOE, YOS = 1
LF6Y2	Loss rate: first term, 6-year TOE, YOS = 2
LF6Y3	Loss rate: first term, 6-year TOE, YOS = 3
LF6Y4	Loss rate: first term, 6-year TOE, YOS = 4
LF6Y5	Loss rate: first term, 6-year TOE, YOS = 5
LF6Y6	Loss rate: first term, 6-year TOE, YOS = 6
LF6Y7	Loss rate: first term, 6-year TOE, YOS = 7

SG	CEMPG	LF6Y0	LF6Y1	LF6Y2	LF6Y3	LF6Y4	LF6Y5	LF6Y6	LF6Y7
Sector Averages									
S	.	0.124	0.089	0.071	0.070	0.072	0.335	0.071	0.003
L	.	0.129	0.115	0.097	0.096	0.096	0.450	0.273	0.263
M	.	0.124	0.083	0.063	0.064	0.065	0.414	0.243	0.085
H	.	0.107	0.056	0.040	0.040	0.040	0.459	0.173	0.100

Support Sector									
S	472	0.110	0.110	0.085	0.074	0.083	0.357	0.000	0.000
S	602	0.078	0.108	0.055	0.090	0.090	0.357	0.000	0.000
S	603	0.137	0.112	0.094	0.094	0.094	0.380	0.306	0.000
S	605	0.134	0.109	0.091	0.091	0.091	0.217	0.000	0.000
S	611	0.130	0.096	0.078	0.078	0.078	0.378	0.000	0.000
S	612	0.000	0.097	0.079	0.027	0.079	0.383	0.000	0.000
S	622	0.131	0.132	0.114	0.114	0.114	0.369	0.337	0.000
S	645	0.128	0.079	0.062	0.061	0.062	0.320	0.000	0.000
S	651	0.123	0.118	0.100	0.100	0.100	0.000	0.288	0.000
S	661	0.000	0.000	0.000	0.000	0.000	0.343	0.306	0.000
S	672	0.119	0.062	0.044	0.044	0.044	0.422	0.000	0.000
S	673	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	691	0.000	0.000	0.000	0.106	0.106	0.329	0.311	0.000
S	701	0.128	0.086	0.068	0.068	0.068	0.000	0.000	0.000
S	702	0.131	0.092	0.074	0.074	0.074	0.313	0.054	0.000
S	703	0.000	0.087	0.069	0.069	0.069	0.313	0.000	0.000
S	705	0.000	0.092	0.000	0.074	0.000	0.313	0.000	0.000
S	732	0.110	0.065	0.049	0.056	0.055	0.285	0.033	0.038
S	733	0.000	0.000	0.000	0.057	0.057	0.300	0.288	0.000
S	734	0.000	0.000	0.000	0.000	0.019	0.300	0.194	0.000
S	741	0.128	0.159	0.141	0.141	0.141	0.248	0.000	0.000
S	742	0.000	0.159	0.000	0.000	0.141	0.245	0.000	0.400
S	753	0.122	0.072	0.054	0.054	0.054	0.403	0.000	0.000

SG	CEMPG	LF6Y0	LF6Y1	LF6Y2	LF6Y3	LF6Y4	LF6Y5	LF6Y6	LF6Y7
S	791	0.082	0.115	0.066	0.048	0.100	0.378	0.095	0.000
S	902	0.125	0.088	0.070	0.064	0.064	0.425	0.000	0.000
S	905	0.121	0.084	0.066	0.066	0.066	0.421	0.000	0.000
S	906	0.127	0.091	0.073	0.073	0.073	0.402	0.354	0.000
S	912	0.123	0.096	0.000	0.000	0.078	0.482	0.000	0.000
S	914	0.000	0.097	0.079	0.000	0.079	0.307	0.000	0.000
S	915	0.123	0.100	0.082	0.082	0.082	0.000	0.000	0.000
S	926	0.127	0.000	0.085	0.000	0.085	0.000	0.000	0.000
S	981	0.122	0.070	0.052	0.052	0.052	0.470	0.000	0.000

Low Training Sector

L	100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
L	116	0.000	0.000	0.102	0.102	0.102	0.493	0.382	0.480
L	121	0.106	0.050	0.032	0.032	0.032	0.400	0.000	0.000
L	122	0.125	0.065	0.047	0.000	0.047	0.399	0.000	0.000
L	242	0.000	0.000	0.000	0.063	0.063	0.352	0.000	0.447
L	271	0.130	0.090	0.072	0.072	0.072	0.322	0.000	0.000
L	274	0.125	0.088	0.070	0.070	0.070	0.410	0.000	0.000
L	276	0.125	0.086	0.068	0.068	0.068	0.461	0.000	0.502
L	277	0.122	0.084	0.000	0.066	0.000	0.503	0.000	0.000
L	296	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
L	297	0.000	0.000	0.000	0.000	0.000	0.369	0.000	0.000
L	462	0.132	0.087	0.069	0.069	0.069	0.440	0.359	0.000
L	511	0.110	0.057	0.039	0.039	0.039	0.586	0.397	0.000
L	551	0.136	0.110	0.092	0.092	0.092	0.498	0.000	0.000
L	552	0.121	0.106	0.093	0.079	0.091	0.456	0.000	0.000
L	554	0.000	0.109	0.091	0.000	0.091	0.490	0.405	0.000
L	555	0.000	0.000	0.000	0.000	0.092	0.490	0.000	0.000
L	566	0.000	0.089	0.000	0.071	0.043	0.460	0.000	0.000
L	571	0.125	0.092	0.074	0.074	0.074	0.504	0.400	0.000
L	591	0.000	0.000	0.000	0.000	0.030	0.396	0.000	0.000
L	631	0.130	0.136	0.118	0.118	0.118	0.415	0.000	0.000
L	811	0.133	0.127	0.109	0.109	0.109	0.469	0.330	0.405
L	871	0.129	0.093	0.075	0.075	0.000	0.452	0.000	0.000
L	872	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
L	911	0.119	0.097	0.000	0.000	0.079	0.000	0.000	0.000
L	950	0.115	0.073	0.061	0.022	0.022	0.164	0.013	0.007
L	995	0.042	0.026	0.042	0.044	0.054	0.409	0.136	0.000
L	996	0.000	0.063	0.059	0.059	0.060	0.273	0.000	0.000
L	997	0.000	0.000	0.000	0.060	0.000	0.000	0.000	0.000

Moderate Training Sector

M	111	0.000	0.116	0.098	0.098	0.098	0.493	0.000	0.000
M	112	0.000	0.119	0.000	0.000	0.000	0.000	0.000	0.000
M	113	0.000	0.000	0.000	0.059	0.059	0.197	0.000	0.000
M	114	0.128	0.118	0.100	0.100	0.100	0.000	0.381	0.000
M	115	0.116	0.111	0.093	0.093	0.093	0.493	0.382	0.000

SG	CENPG	LF6Y0	LF6Y1	LF6Y2	LF6Y3	LF6Y4	LF6Y5	LF6Y6	LF6Y7
M	205	0.114	0.059	0.041	0.041	0.041	0.435	0.413	0.519
M	206	0.117	0.060	0.042	0.042	0.042	0.351	0.086	0.158
M	209	0.108	0.056	0.038	0.038	0.038	0.428	0.000	0.000
M	222	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
M	231	0.105	0.088	0.062	0.066	0.070	0.375	0.159	0.000
M	241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
M	251	0.112	0.070	0.052	0.052	0.052	0.476	0.389	0.490
M	272	0.116	0.079	0.061	0.061	0.061	0.646	0.382	0.000
M	275	0.116	0.079	0.061	0.061	0.061	0.550	0.385	0.484
M	291	0.124	0.066	0.046	0.048	0.048	0.363	0.296	0.011
M	391	0.116	0.074	0.000	0.056	0.056	0.000	0.000	0.000
M	392	0.114	0.075	0.000	0.000	0.057	0.426	0.000	0.000
M	404	0.039	0.023	0.035	0.051	0.035	0.471	0.000	0.000
M	427	0.132	0.093	0.062	0.068	0.075	0.389	0.136	0.000
M	432	0.131	0.091	0.071	0.070	0.073	0.410	0.173	0.165
M	445	0.084	0.101	0.069	0.069	0.078	0.373	0.000	0.000
M	461	0.134	0.087	0.069	0.069	0.069	0.387	0.342	0.000
M	463	0.124	0.080	0.062	0.062	0.062	0.546	0.351	0.000
M	542	0.097	0.055	0.051	0.051	0.051	0.463	0.346	0.000
M	545	0.125	0.066	0.050	0.050	0.051	0.479	0.281	0.000
M	553	0.108	0.099	0.081	0.081	0.081	0.491	0.405	0.000
M	821	0.000	0.000	0.000	0.000	0.051	0.424	0.000	0.436
M	903	0.119	0.084	0.066	0.066	0.066	0.499	0.000	0.000
M	907	0.118	0.082	0.064	0.064	0.064	0.419	0.000	0.000
M	908	0.121	0.085	0.067	0.067	0.000	0.000	0.000	0.000
M	913	0.000	0.091	0.000	0.000	0.000	0.000	0.000	0.000
M	918	0.107	0.084	0.066	0.066	0.066	0.482	0.000	0.000
M	924	0.111	0.093	0.069	0.075	0.075	0.397	0.345	0.000

High Training Sector

H	202	0.114	0.059	0.041	0.041	0.041	0.424	0.000	0.000
H	203	0.000	0.000	0.000	0.000	0.045	0.000	0.000	0.000
H	207	0.127	0.070	0.052	0.052	0.052	0.423	0.113	0.000
H	208	0.116	0.060	0.042	0.042	0.042	0.432	0.103	0.000
H	273	0.118	0.081	0.063	0.000	0.063	0.503	0.000	0.000
H	301	0.108	0.044	0.026	0.026	0.026	0.522	0.293	0.187
H	307	0.112	0.046	0.028	0.028	0.028	0.481	0.415	0.000
H	316	0.084	0.053	0.037	0.038	0.038	0.137	0.133	0.000
H	324	0.106	0.055	0.037	0.037	0.037	0.540	0.000	0.502
H	329	0.086	0.050	0.040	0.040	0.040	0.462	0.222	0.174
H	341	0.098	0.066	0.048	0.044	0.048	0.501	0.329	0.000
H	362	0.125	0.076	0.059	0.059	0.059	0.535	0.000	0.000
H	443	0.126	0.108	0.087	0.087	0.000	0.000	0.000	0.000
H	464	0.132	0.085	0.067	0.067	0.067	0.432	0.000	0.000
H	919	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
H	982	0.118	0.066	0.048	0.048	0.000	0.000	0.000	0.000
H	991	0.000	0.063	0.000	0.000	0.012	0.000	0.000	0.000

LOSS RATES: SECOND TERM

SG	Sector group
CEMPG	Chief enlisted manager progression group
LSY6	Loss rate: second term, YETS = 6
LSY5	Loss rate: second term, YETS = 5
LSY4	Loss rate: second term, YETS = 4
LSY3	Loss rate: second term, YETS = 3
LSY2	Loss rate: second term, YETS = 2
LSY1	Loss rate: second term, YETS = 1
LSY0	Loss rate: second term, YETS = 0
LSY-1	Loss rate: second term, YETS = -1

SG	CEMPG	LSY6	LSY5	LSY4	LSY3	LSY2	LSY1	LSY0	LSY-1
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Sector Averages

S	.	0.020	0.039	0.025	0.039	0.042	0.211	0.235	0.170
L	.	0.011	0.030	0.019	0.031	0.036	0.234	0.304	0.217
M	.	0.013	0.031	0.023	0.030	0.039	0.235	0.237	0.134
H	.	0.008	0.025	0.020	0.027	0.035	0.250	0.237	0.145

Support Sector

S	472	0.016	0.034	0.023	0.033	0.040	0.220	0.240	0.082
S	602	0.015	0.034	0.018	0.034	0.035	0.175	0.162	0.111
S	603	0.013	0.034	0.019	0.033	0.038	0.218	0.162	0.134
S	605	0.014	0.033	0.018	0.034	0.035	0.167	0.162	0.134
S	611	0.013	0.034	0.022	0.038	0.040	0.209	0.282	0.233
S	612	0.018	0.038	0.018	0.039	0.038	0.207	0.282	0.000
S	622	0.029	0.051	0.031	0.047	0.050	0.192	0.292	0.241
S	645	0.017	0.037	0.023	0.036	0.039	0.188	0.285	0.221
S	651	0.014	0.028	0.024	0.031	0.035	0.257	0.233	0.000
S	661	0.103	0.122	0.107	0.119	0.127	0.207	0.210	0.000
S	672	0.016	0.032	0.016	0.032	0.036	0.211	0.212	0.172
S	673	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	691	0.053	0.064	0.065	0.066	0.078	0.116	0.192	0.158
S	701	0.022	0.038	0.019	0.036	0.036	0.179	0.198	0.000
S	702	0.019	0.038	0.021	0.037	0.040	0.176	0.200	0.166
S	703	0.011	0.045	0.021	0.037	0.043	0.188	0.198	0.164
S	705	0.022	0.032	0.015	0.034	0.036	0.167	0.198	0.164
S	732	0.025	0.042	0.032	0.045	0.049	0.226	0.236	0.181
S	733	0.025	0.042	0.022	0.042	0.046	0.280	0.243	0.201
S	734	0.028	0.036	0.022	0.039	0.047	0.294	0.243	0.130
S	741	0.010	0.036	0.014	0.034	0.036	0.227	0.231	0.191
S	742	0.000	0.016	0.009	0.025	0.027	0.223	0.231	0.191
S	753	0.026	0.039	0.023	0.040	0.043	0.328	0.220	0.000

SG	CEMPG	LSY6	LSY5	LSY4	LSY3	LSY2	LSY1	LSY0	LSY-1
S	791	0.011	0.038	0.036	0.044	0.048	0.251	0.247	0.000
S	902	0.026	0.043	0.031	0.044	0.048	0.279	0.259	0.204
S	905	0.030	0.045	0.037	0.043	0.053	0.218	0.265	0.219
S	906	0.028	0.048	0.032	0.045	0.049	0.284	0.265	0.219
S	912	0.030	0.053	0.037	0.048	0.047	0.271	0.000	0.000
S	914	0.013	0.036	0.031	0.044	0.048	0.246	0.162	0.000
S	915	0.028	0.046	0.031	0.045	0.050	0.284	0.306	0.253
S	926	0.007	0.029	0.010	0.028	0.032	0.145	0.297	0.000
S	981	0.016	0.035	0.018	0.031	0.035	0.299	0.311	0.257

Low Training Sector

L	100	0.000	0.000	0.000	0.000	0.000	0.183	0.000	0.250
L	116	0.017	0.034	0.028	0.035	0.046	0.234	0.247	0.000
L	121	0.016	0.034	0.026	0.037	0.032	0.215	0.000	0.000
L	122	0.013	0.026	0.017	0.031	0.033	0.148	0.291	0.241
L	242	0.031	0.051	0.042	0.050	0.062	0.319	0.273	0.226
L	271	0.012	0.030	0.014	0.030	0.033	0.335	0.308	0.255
L	274	0.005	0.027	0.024	0.028	0.036	0.285	0.308	0.255
L	276	0.011	0.030	0.025	0.031	0.037	0.188	0.308	0.255
L	277	0.000	0.021	0.020	0.024	0.032	0.284	0.308	0.000
L	296	0.000	0.013	0.008	0.021	0.027	0.181	0.305	0.000
L	297	0.000	0.000	0.000	0.023	0.025	0.000	0.000	0.252
L	462	0.001	0.021	0.011	0.023	0.030	0.201	0.262	0.216
L	511	0.010	0.027	0.023	0.028	0.036	0.315	0.313	0.258
L	551	0.025	0.043	0.028	0.043	0.048	0.233	0.240	0.129
L	552	0.026	0.044	0.030	0.044	0.048	0.234	0.240	0.171
L	554	0.029	0.047	0.043	0.044	0.053	0.192	0.240	0.198
L	555	0.022	0.043	0.025	0.044	0.048	0.234	0.240	0.198
L	566	0.025	0.040	0.024	0.042	0.042	0.152	0.289	0.065
L	571	0.017	0.040	0.019	0.037	0.039	0.270	0.298	0.246
L	591	0.000	0.031	0.028	0.037	0.046	0.193	0.000	0.000
L	631	0.015	0.030	0.016	0.032	0.035	0.185	0.315	0.260
L	811	0.011	0.029	0.018	0.031	0.036	0.218	0.310	0.239
L	871	0.000	0.038	0.009	0.027	0.029	0.207	0.312	0.000
L	872	0.000	0.000	0.000	0.016	0.024	0.121	0.000	0.000
L	911	0.019	0.053	0.035	0.045	0.051	0.324	0.000	0.000
L	990	0.002	0.019	0.022	0.027	0.039	0.230	0.450	0.025
L	995	0.004	0.021	0.009	0.027	0.032	0.244	0.491	0.291
L	996	0.008	0.032	0.014	0.029	0.031	0.247	0.429	0.232
L	997	0.000	0.036	0.019	0.038	0.037	0.280	0.000	0.000

Moderate Training Sector

M	111	0.017	0.032	0.032	0.034	0.045	0.157	0.247	0.204
M	112	0.018	0.033	0.032	0.036	0.045	0.179	0.247	0.000
M	113	0.007	0.029	0.023	0.031	0.042	0.200	0.247	0.204
M	114	0.019	0.037	0.033	0.035	0.046	0.183	0.247	0.000
M	115	0.018	0.031	0.027	0.035	0.043	0.213	0.247	0.000

SG	CEMPG	LSY6	LSY5	LSY4	LSY3	LSY2	LSY1	LSY0	LSY-1
M	205	0.000	0.017	0.011	0.015	0.023	0.260	0.256	0.000
M	206	0.000	0.019	0.011	0.019	0.026	0.237	0.221	0.000
M	209	0.000	0.009	0.006	0.019	0.031	0.250	0.000	0.000
M	222	0.117	0.135	0.131	0.134	0.146	0.186	0.000	0.000
M	231	0.023	0.034	0.026	0.041	0.045	0.188	0.301	0.137
M	241	0.023	0.038	0.044	0.048	0.057	0.270	0.273	0.226
M	251	0.005	0.021	0.016	0.022	0.030	0.284	0.305	0.252
M	272	0.008	0.026	0.024	0.027	0.035	0.364	0.308	0.255
M	275	0.011	0.028	0.026	0.026	0.038	0.333	0.308	0.000
M	291	0.010	0.029	0.014	0.026	0.031	0.194	0.332	0.275
M	391	0.014	0.031	0.015	0.028	0.035	0.132	0.237	0.196
M	392	0.009	0.028	0.027	0.031	0.039	0.186	0.237	0.196
M	404	0.000	0.009	0.000	0.007	0.012	0.270	0.225	0.107
M	427	0.011	0.030	0.022	0.031	0.037	0.206	0.255	0.025
M	432	0.014	0.032	0.024	0.031	0.040	0.235	0.212	0.117
M	445	0.028	0.044	0.042	0.044	0.056	0.246	0.000	0.000
M	461	0.006	0.022	0.016	0.021	0.032	0.207	0.254	0.210
M	463	0.005	0.022	0.019	0.022	0.032	0.273	0.254	0.210
M	542	0.016	0.034	0.022	0.036	0.041	0.268	0.253	0.164
M	545	0.014	0.034	0.024	0.035	0.038	0.276	0.253	0.209
M	553	0.025	0.041	0.036	0.042	0.050	0.218	0.240	0.000
M	821	0.011	0.028	0.015	0.033	0.040	0.193	0.235	0.194
M	903	0.019	0.028	0.027	0.043	0.048	0.280	0.265	0.000
M	907	0.026	0.053	0.030	0.044	0.051	0.204	0.265	0.219
M	908	0.024	0.047	0.031	0.046	0.047	0.242	0.265	0.219
M	913	0.002	0.043	0.040	0.039	0.050	0.245	0.250	0.000
M	918	0.030	0.046	0.036	0.044	0.052	0.242	0.306	0.253
M	924	0.010	0.025	0.011	0.026	0.028	0.157	0.292	0.225

High Training Sector

H	202	0.001	0.018	0.012	0.019	0.026	0.280	0.256	0.212
H	203	0.000	0.005	0.015	0.000	0.022	0.169	0.000	0.000
H	207	0.000	0.016	0.010	0.020	0.025	0.283	0.256	0.212
H	208	0.000	0.014	0.010	0.017	0.025	0.277	0.096	0.000
H	273	0.011	0.028	0.024	0.028	0.034	0.297	0.308	0.000
H	301	0.009	0.028	0.022	0.030	0.037	0.248	0.344	0.238
H	307	0.009	0.027	0.019	0.029	0.036	0.260	0.353	0.292
H	316	0.008	0.026	0.022	0.025	0.034	0.271	0.237	0.000
H	324	0.007	0.020	0.014	0.023	0.031	0.179	0.302	0.249
H	329	0.006	0.023	0.018	0.025	0.034	0.250	0.154	0.095
H	341	0.017	0.027	0.020	0.035	0.037	0.241	0.226	0.157
H	362	0.022	0.039	0.032	0.041	0.047	0.223	0.224	0.133
H	443	0.026	0.046	0.043	0.047	0.051	0.255	0.189	0.000
H	464	0.005	0.018	0.016	0.020	0.032	0.247	0.254	0.000
H	919	0.000	0.031	0.039	0.034	0.044	0.258	0.000	0.000
H	982	0.018	0.041	0.018	0.030	0.033	0.333	0.311	0.257
H	991	0.009	0.023	0.024	0.031	0.040	0.192	0.198	0.024

LOSS RATES: CAREER TERMS

SG	Sector group
CEMPG	Chief enlisted manager progression group
LCY6	Loss rate: career terms, YETS = 6
LCY5	Loss rate: career terms, YETS = 5
LCY4	Loss rate: career terms, YETS = 4
LCY3	Loss rate: career terms, YETS = 3
LCY2	Loss rate: career terms, YETS = 2
LCY1	Loss rate: career terms, YETS = 1
LCY0	Loss rate: career terms, YETS = 0
LC1-1	Loss rate: career terms, YETS = -1

SG	CEMPG	LCY6	LCY5	LCY4	LCY3	LCY2	LCY1	LCY0	LCY-1
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Sector Averages

S	.	0.009	0.012	0.010	0.011	0.012	0.042	0.338	0.473
L	.	0.009	0.012	0.010	0.011	0.011	0.040	0.362	0.491
M	.	0.008	0.012	0.009	0.010	0.010	0.033	0.321	0.435
H	.	0.009	0.012	0.011	0.011	0.011	0.036	0.330	0.399

Support Sector

S	472	0.007	0.010	0.007	0.010	0.010	0.045	0.361	0.516
S	602	0.009	0.013	0.010	0.011	0.013	0.041	0.319	0.386
S	603	0.010	0.013	0.012	0.013	0.011	0.039	0.318	0.448
S	605	0.009	0.012	0.009	0.011	0.012	0.041	0.319	0.456
S	611	0.009	0.012	0.010	0.012	0.012	0.040	0.360	0.508
S	612	0.010	0.010	0.009	0.012	0.012	0.041	0.355	0.508
S	622	0.010	0.011	0.008	0.010	0.011	0.038	0.323	0.455
S	645	0.009	0.012	0.010	0.012	0.012	0.040	0.321	0.453
S	651	0.009	0.013	0.009	0.009	0.010	0.035	0.362	0.510
S	661	0.009	0.010	0.007	0.010	0.010	0.032	0.360	0.508
S	672	0.009	0.012	0.013	0.014	0.014	0.042	0.287	0.486
S	673	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.487
S	691	0.010	0.011	0.010	0.011	0.011	0.028	0.364	0.513
S	701	0.010	0.013	0.011	0.011	0.011	0.052	0.347	0.489
S	702	0.009	0.012	0.009	0.011	0.012	0.046	0.346	0.488
S	703	0.009	0.010	0.009	0.009	0.010	0.045	0.347	0.000
S	705	0.009	0.012	0.008	0.010	0.012	0.044	0.347	0.489
S	732	0.009	0.011	0.009	0.011	0.012	0.037	0.345	0.479
S	733	0.009	0.012	0.011	0.010	0.009	0.028	0.349	0.493
S	734	0.005	0.011	0.009	0.011	0.011	0.037	0.348	0.491
S	741	0.009	0.012	0.009	0.011	0.010	0.034	0.364	0.513
S	742	0.009	0.010	0.008	0.010	0.010	0.028	0.364	0.513
S	753	0.009	0.011	0.009	0.011	0.012	0.039	0.494	0.697

SG	CEMPG	LCY6	LCY5	LCY4	LCY3	LCY2	LCY1	LCY0	LCY-1
S	791	0.009	0.010	0.010	0.011	0.010	0.031	0.361	0.509
S	902	0.009	0.012	0.009	0.011	0.012	0.049	0.343	0.484
S	905	0.010	0.010	0.009	0.011	0.010	0.052	0.348	0.491
S	906	0.009	0.012	0.011	0.012	0.011	0.048	0.348	0.490
S	912	0.010	0.015	0.010	0.012	0.013	0.057	0.314	0.000
S	914	0.008	0.014	0.009	0.009	0.011	0.043	0.193	0.000
S	915	0.009	0.012	0.011	0.013	0.012	0.047	0.314	0.443
S	926	0.010	0.011	0.009	0.012	0.011	0.056	0.368	0.519
S	981	0.009	0.012	0.009	0.012	0.011	0.053	0.369	0.521

Low Training Sector

L	100	0.008	0.009	0.006	0.007	0.008	0.020	0.368	0.519
L	116	0.008	0.009	0.006	0.009	0.009	0.038	0.434	0.612
L	121	0.010	0.012	0.011	0.011	0.014	0.032	0.369	0.000
L	122	0.010	0.012	0.009	0.011	0.011	0.050	0.369	0.520
L	242	0.010	0.011	0.009	0.010	0.012	0.031	0.359	0.506
L	271	0.009	0.011	0.009	0.012	0.012	0.047	0.349	0.492
L	274	0.009	0.012	0.011	0.012	0.012	0.033	0.350	0.493
L	276	0.009	0.011	0.009	0.010	0.011	0.034	0.351	0.495
L	277	0.009	0.009	0.011	0.015	0.014	0.029	0.000	0.000
L	296	0.009	0.012	0.008	0.010	0.010	0.032	0.427	0.602
L	297	0.009	0.013	0.007	0.008	0.009	0.034	0.427	0.000
L	462	0.008	0.012	0.010	0.010	0.009	0.040	0.319	0.450
L	511	0.009	0.012	0.011	0.010	0.011	0.033	0.399	0.574
L	551	0.009	0.012	0.010	0.011	0.011	0.040	0.346	0.489
L	552	0.009	0.012	0.009	0.012	0.012	0.042	0.331	0.468
L	554	0.009	0.011	0.009	0.010	0.013	0.034	0.352	0.496
L	555	0.009	0.012	0.009	0.010	0.011	0.044	0.352	0.496
L	566	0.010	0.013	0.008	0.010	0.011	0.040	0.352	0.357
L	571	0.009	0.011	0.010	0.011	0.012	0.049	0.287	0.405
L	591	0.005	0.006	0.005	0.008	0.011	0.038	0.000	0.000
L	631	0.009	0.012	0.009	0.012	0.012	0.046	0.399	0.563
L	811	0.009	0.014	0.011	0.012	0.012	0.040	0.365	0.509
L	871	0.008	0.012	0.008	0.011	0.011	0.049	0.338	0.476
L	872	0.007	0.009	0.007	0.010	0.011	0.043	0.360	0.000
L	911	0.000	0.009	0.009	0.012	0.013	0.046	0.314	0.443
L	990	0.010	0.016	0.017	0.018	0.022	0.045	0.417	0.070
L	995	0.010	0.012	0.010	0.011	0.012	0.041	0.411	0.572
L	996	0.010	0.013	0.010	0.012	0.011	0.039	0.362	0.535
L	997	0.003	0.012	0.010	0.011	0.011	0.034	0.421	0.374

Moderate Training Sector

M	111	0.007	0.007	0.008	0.008	0.012	0.029	0.434	0.612
M	112	0.007	0.008	0.008	0.008	0.009	0.034	0.434	0.000
M	113	0.006	0.010	0.008	0.008	0.008	0.033	0.433	0.547
M	114	0.007	0.009	0.008	0.007	0.009	0.029	0.434	0.612
M	115	0.007	0.011	0.009	0.009	0.010	0.036	0.434	0.000

SG	CEMPG	LCY6	LCY5	LCY4	LCY3	LCY2	LCY1	LCY0	LCY-1
M	205	0.010	0.014	0.009	0.012	0.015	0.027	0.354	0.499
M	206	0.009	0.011	0.012	0.012	0.012	0.040	0.348	0.491
M	209	0.010	0.016	0.010	0.009	0.009	0.020	0.354	0.000
M	222	0.008	0.014	0.010	0.016	0.016	0.032	0.366	0.000
M	231	0.009	0.010	0.008	0.010	0.010	0.041	0.374	0.527
M	241	0.010	0.014	0.010	0.011	0.011	0.032	0.359	0.506
M	251	0.009	0.014	0.012	0.012	0.011	0.029	0.367	0.518
M	272	0.009	0.014	0.012	0.012	0.012	0.028	0.350	0.493
M	275	0.010	0.012	0.011	0.009	0.011	0.042	0.350	0.493
M	291	0.009	0.012	0.009	0.011	0.011	0.045	0.417	0.588
M	391	0.007	0.010	0.006	0.007	0.008	0.033	0.410	0.578
M	392	0.008	0.009	0.007	0.008	0.008	0.035	0.420	0.593
M	404	0.006	0.009	0.006	0.008	0.008	0.042	0.324	0.458
M	427	0.007	0.012	0.009	0.010	0.010	0.034	0.269	0.379
M	432	0.007	0.012	0.010	0.010	0.010	0.030	0.292	0.399
M	445	0.008	0.011	0.010	0.010	0.010	0.032	0.164	0.231
M	461	0.007	0.010	0.007	0.009	0.010	0.045	0.276	0.390
M	463	0.007	0.010	0.009	0.009	0.012	0.029	0.330	0.466
M	542	0.007	0.010	0.007	0.009	0.009	0.038	0.311	0.439
M	545	0.007	0.011	0.008	0.009	0.010	0.039	0.310	0.437
M	553	0.009	0.013	0.011	0.012	0.011	0.024	0.352	0.496
M	821	0.009	0.011	0.010	0.011	0.010	0.032	0.362	0.511
M	903	0.008	0.012	0.008	0.010	0.011	0.039	0.345	0.423
M	907	0.009	0.011	0.008	0.009	0.011	0.049	0.348	0.491
M	908	0.009	0.012	0.009	0.009	0.010	0.035	0.348	0.491
M	913	0.006	0.011	0.009	0.010	0.011	0.044	0.241	0.000
M	918	0.009	0.009	0.011	0.009	0.010	0.030	0.314	0.443
M	924	0.009	0.011	0.010	0.011	0.010	0.044	0.339	0.446

High Training Sector

H	202	0.010	0.013	0.012	0.012	0.013	0.034	0.354	0.499
H	203	0.008	0.011	0.008	0.011	0.012	0.102	0.000	0.000
H	207	0.009	0.014	0.011	0.012	0.013	0.051	0.352	0.281
H	208	0.009	0.014	0.012	0.012	0.014	0.038	0.304	0.457
H	273	0.010	0.014	0.013	0.012	0.010	0.043	0.350	0.000
H	301	0.009	0.012	0.010	0.011	0.011	0.036	0.344	0.461
H	307	0.010	0.012	0.011	0.011	0.012	0.035	0.335	0.472
H	316	0.009	0.012	0.010	0.011	0.011	0.039	0.417	0.545
H	324	0.009	0.010	0.008	0.009	0.009	0.041	0.373	0.526
H	329	0.009	0.013	0.011	0.011	0.011	0.034	0.323	0.317
H	341	0.008	0.010	0.008	0.009	0.011	0.030	0.336	0.468
H	362	0.007	0.008	0.008	0.009	0.009	0.037	0.264	0.372
H	443	0.006	0.011	0.009	0.009	0.009	0.037	0.278	0.307
H	464	0.007	0.010	0.008	0.010	0.010	0.030	0.330	0.466
H	919	0.010	0.009	0.008	0.015	0.010	0.136	0.000	0.000
H	982	0.009	0.010	0.013	0.014	0.010	0.054	0.369	0.000
H	991	0.011	0.015	0.013	0.013	0.013	0.026	0.107	0.225

LOSS RATES: RETIREMENT TERMS, YOS = 19-24

SG	Sector group
CEMPG	Chief enlisted manager progression group
LRY19	Loss rate: retirement terms, YOS = 19
LRY20	Loss rate: retirement terms, YOS = 20
LRY21	Loss rate: retirement terms, YOS = 21
LRY22	Loss rate: retirement terms, YOS = 22
LRY23	Loss rate: retirement terms, YOS = 23
LRY24	Loss rate: retirement terms, YOS = 24

SG	CEMPG	LRY19	LRY20	LRY21	LRY22	LRY23	LRY24
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Sector Averages

S	.	0.321	0.328	0.229	0.290	0.205	0.166
L	.	0.328	0.334	0.233	0.277	0.211	0.168
M	.	0.339	0.353	0.252	0.308	0.229	0.183
H	.	0.314	0.328	0.229	0.276	0.202	0.155

Support Sector

S	472	0.355	0.334	0.259	0.330	0.245	0.209
S	602	0.309	0.278	0.228	0.324	0.175	0.166
S	603	0.373	0.328	0.231	0.362	0.200	0.140
S	605	0.276	0.325	0.218	0.264	0.201	0.165
S	611	0.404	0.376	0.275	0.331	0.232	0.194
S	612	0.344	0.329	0.195	0.296	0.241	0.186
S	622	0.391	0.371	0.266	0.375	0.217	0.183
S	645	0.315	0.324	0.229	0.297	0.207	0.171
S	651	0.319	0.330	0.229	0.241	0.185	0.151
S	661	0.330	0.337	0.245	0.245	0.206	0.148
S	672	0.291	0.309	0.212	0.287	0.200	0.167
S	673	0.000	0.000	0.208	0.206	0.000	0.000
S	691	0.359	0.320	0.217	0.312	0.202	0.130
S	701	0.308	0.339	0.243	0.282	0.191	0.130
S	702	0.319	0.330	0.231	0.281	0.203	0.165
S	703	0.366	0.351	0.235	0.349	0.205	0.149
S	705	0.331	0.330	0.217	0.266	0.202	0.164
S	732	0.305	0.318	0.213	0.275	0.203	0.164
S	733	0.322	0.339	0.223	0.248	0.189	0.153
S	734	0.298	0.313	0.214	0.289	0.213	0.170
S	741	0.341	0.350	0.235	0.333	0.194	0.161
S	742	0.327	0.317	0.212	0.289	0.184	0.154
S	753	0.316	0.286	0.207	0.347	0.190	0.157

SG	CEMPG	LRY19	LRY20	LRY21	LRY22	LRY23	LRY24
S	791	0.275	0.311	0.213	0.246	0.178	0.107
S	902	0.318	0.332	0.233	0.305	0.218	0.165
S	905	0.351	0.335	0.225	0.355	0.216	0.166
S	906	0.342	0.345	0.228	0.279	0.199	0.166
S	912	0.000	0.420	0.256	0.000	0.000	0.000
S	914	0.316	0.330	0.285	0.055	0.162	0.158
S	915	0.347	0.345	0.257	0.298	0.210	0.172
S	926	0.347	0.364	0.256	0.272	0.247	0.210
S	981	0.334	0.350	0.246	0.303	0.211	0.170

Low Training Sector

L	100	0.314	0.332	0.229	0.260	0.208	0.168
L	116	0.411	0.396	0.274	0.326	0.254	0.175
L	121	0.301	0.312	0.000	0.000	0.000	0.170
L	122	0.347	0.344	0.236	0.296	0.205	0.175
L	242	0.350	0.366	0.251	0.328	0.234	0.196
L	271	0.330	0.351	0.243	0.311	0.220	0.169
L	274	0.339	0.342	0.249	0.271	0.211	0.173
L	276	0.343	0.296	0.249	0.301	0.223	0.179
L	277	0.350	0.420	0.190	0.000	0.000	0.000
L	296	0.362	0.345	0.253	0.294	0.214	0.177
L	297	0.356	0.343	0.229	0.282	0.203	0.201
L	462	0.350	0.356	0.255	0.283	0.229	0.176
L	511	0.314	0.331	0.233	0.263	0.216	0.182
L	551	0.304	0.353	0.246	0.337	0.232	0.122
L	552	0.351	0.333	0.250	0.304	0.221	0.167
L	554	0.349	0.324	0.252	0.329	0.232	0.203
L	555	0.377	0.382	0.250	0.334	0.222	0.172
L	566	0.310	0.336	0.176	0.244	0.189	0.167
L	571	0.337	0.339	0.237	0.260	0.209	0.165
L	591	0.275	0.240	0.000	0.162	0.096	0.000
L	631	0.374	0.365	0.269	0.295	0.236	0.177
L	811	0.336	0.344	0.249	0.303	0.229	0.193
L	871	0.210	0.229	0.229	0.180	0.213	0.176
L	872	0.320	0.346	0.249	0.261	0.214	0.194
L	911	0.311	0.315	0.000	0.258	0.207	0.141
L	990	0.426	0.272	0.131	0.237	0.126	0.013
L	995	0.300	0.313	0.203	0.236	0.177	0.146
L	996	0.281	0.288	0.190	0.221	0.167	0.125
L	997	0.287	0.237	0.220	0.221	0.140	0.138

Moderate Training Sector

M	111	0.345	0.374	0.238	0.296	0.238	0.202
M	112	0.388	0.373	0.250	0.311	0.243	0.188
M	113	0.292	0.352	0.256	0.297	0.244	0.204
M	114	0.348	0.358	0.263	0.314	0.234	0.184
M	115	0.288	0.341	0.277	0.000	0.210	0.000

SG	CEMPG	LRY19	LRY20	LRY21	LRY22	LRY23	LRY24
M	205	0.318	0.312	0.228	0.249	0.214	0.000
M	206	0.283	0.335	0.202	0.278	0.180	0.164
M	209	0.324	0.354	0.253	0.227	0.243	0.000
M	222	0.340	0.327	0.000	0.239	0.216	0.196
M	231	0.334	0.326	0.228	0.262	0.180	0.091
M	241	0.354	0.379	0.255	0.294	0.235	0.184
M	251	0.344	0.340	0.235	0.283	0.209	0.178
M	272	0.321	0.337	0.241	0.250	0.206	0.174
M	275	0.342	0.330	0.255	0.335	0.243	0.242
M	291	0.356	0.355	0.253	0.337	0.226	0.187
M	391	0.397	0.372	0.265	0.321	0.220	0.191
M	392	0.409	0.387	0.279	0.323	0.225	0.193
M	404	0.305	0.330	0.174	0.453	0.000	0.184
M	427	0.352	0.363	0.268	0.336	0.227	0.139
M	432	0.340	0.356	0.258	0.313	0.241	0.196
M	445	0.362	0.331	0.266	0.480	0.141	0.105
M	461	0.362	0.366	0.266	0.305	0.243	0.197
M	463	0.350	0.356	0.264	0.397	0.234	0.198
M	542	0.355	0.355	0.260	0.347	0.223	0.189
M	545	0.322	0.330	0.262	0.350	0.243	0.207
M	553	0.343	0.345	0.269	0.305	0.254	0.176
M	821	0.321	0.325	0.223	0.252	0.185	0.155
M	903	0.298	0.320	0.230	0.178	0.163	0.047
M	907	0.334	0.353	0.242	0.273	0.200	0.160
M	908	0.317	0.341	0.228	0.317	0.211	0.145
M	913	0.326	0.282	0.150	0.241	0.145	0.022
M	918	0.331	0.346	0.210	0.235	0.214	0.000
M	924	0.263	0.302	0.208	0.219	0.205	0.183

High Training Sector

H	202	0.336	0.336	0.228	0.243	0.205	0.168
H	203	0.314	0.349	0.225	0.000	0.214	0.207
H	207	0.236	0.330	0.209	0.287	0.224	0.181
H	208	0.256	0.298	0.205	0.311	0.188	0.156
H	273	0.304	0.349	0.192	0.000	0.213	0.175
H	301	0.325	0.337	0.240	0.285	0.214	0.168
H	307	0.335	0.337	0.251	0.247	0.209	0.169
H	316	0.307	0.304	0.206	0.197	0.153	0.069
H	324	0.355	0.357	0.246	0.262	0.199	0.168
H	329	0.313	0.330	0.225	0.284	0.191	0.165
H	341	0.291	0.264	0.211	0.241	0.186	0.125
H	362	0.358	0.354	0.278	0.341	0.247	0.123
H	443	0.307	0.310	0.164	0.443	0.142	0.000
H	464	0.363	0.366	0.241	0.337	0.242	0.164
H	919	0.258	0.000	0.187	0.245	0.000	0.000
H	982	0.373	0.368	0.250	0.322	0.222	0.135
H	991	0.261	0.284	0.179	0.217	0.167	0.127

LOSS RATES: RETIREMENT TERMS, YOS = 25-29

SG	Sector group
CEMPG	Chief enlisted manager progression group
LRY25	Loss rate: retirement terms, YOS = 25
LRY26	Loss rate: retirement terms, YOS = 26
LRY27	Loss rate: retirement terms, YOS = 27
LRY28	Loss rate: retirement terms, YOS = 28
LRY29	Loss rate: retirement terms, YOS = 29

SG	CEMPG	LRY25	LRY26	LRY27	LRY28	LRY29
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Sector Averages

S	.	0.470	0.230	0.428	0.126	1.000
L	.	0.443	0.264	0.443	0.151	1.000
M	.	0.465	0.286	0.417	0.135	1.000
H	.	0.373	0.196	0.281	0.095	1.000

Support Sector

S	472	0.614	0.034	0.199	0.026	1.000
S	602	0.449	0.000	0.197	0.174	1.000
S	603	0.546	0.290	0.504	0.213	1.000
S	605	0.531	0.040	0.177	0.030	1.000
S	611	0.415	0.329	0.541	0.000	1.000
S	612	0.583	0.042	0.000	0.000	1.000
S	622	0.376	0.348	0.529	0.240	1.000
S	645	0.564	0.250	0.450	0.072	1.000
S	651	0.388	0.324	0.574	0.218	1.000
S	661	0.295	0.306	0.537	0.000	1.000
S	672	0.486	0.137	0.417	0.101	1.000
S	673	0.000	0.000	0.000	0.000	1.000
S	691	0.472	0.000	0.427	0.207	1.000
S	701	0.269	0.293	0.249	0.212	1.000
S	702	0.423	0.299	0.697	0.222	1.000
S	703	0.527	0.302	0.506	0.000	1.000
S	705	0.469	0.302	0.346	0.218	1.000
S	732	0.482	0.245	0.221	0.079	1.000
S	733	0.280	0.317	0.394	0.227	1.000
S	734	0.558	0.075	0.192	0.045	1.000
S	741	0.418	0.292	0.588	0.217	1.000
S	742	0.416	0.000	0.307	0.000	1.000
S	753	0.000	0.026	0.023	0.000	1.000

SG	CEMPG	LRY25	LRY26	LRY27	LRY28	LRY29
S	791	0.520	0.122	0.371	0.026	1.000
S	902	0.462	0.112	0.214	0.085	1.000
S	905	0.214	0.000	0.603	0.235	1.000
S	906	0.483	0.309	0.519	0.232	1.000
S	912	0.000	0.000	0.000	0.000	1.000
S	914	0.012	0.000	0.109	0.000	1.000
S	915	0.380	0.304	0.274	0.232	1.000
S	926	0.766	0.000	0.000	0.233	1.000
S	981	0.412	0.299	0.763	0.224	1.000

Low Training Sector

L	100	0.423	0.316	0.477	0.226	1.000
L	116	0.603	0.334	0.000	0.253	1.000
L	121	0.209	0.000	0.000	0.000	1.000
L	122	0.481	0.315	0.641	0.000	1.000
L	242	0.769	0.000	0.280	0.000	1.000
L	271	0.447	0.312	0.730	0.021	1.000
L	274	0.488	0.317	0.488	0.231	1.000
L	276	0.426	0.314	0.664	0.237	1.000
L	277	0.000	0.000	0.000	0.000	1.000
L	296	0.218	0.338	0.650	0.236	1.000
L	297	0.000	0.000	0.000	0.000	1.000
L	462	0.511	0.353	0.576	0.253	1.000
L	511	0.529	0.253	0.327	0.101	1.000
L	551	0.577	0.116	0.197	0.041	1.000
L	552	0.520	0.105	0.189	0.081	1.000
L	554	0.230	0.000	0.000	0.000	1.000
L	555	0.383	0.328	0.484	0.243	1.000
L	566	0.422	0.103	0.213	0.077	1.000
L	571	0.221	0.302	0.674	0.000	1.000
L	591	0.087	0.000	0.000	0.000	1.000
L	631	0.464	0.335	0.493	0.247	1.000
L	811	0.544	0.235	0.323	0.094	1.000
L	871	0.440	0.104	0.317	0.000	1.000
L	872	0.241	0.336	0.543	0.251	1.000
L	911	0.492	0.313	0.520	0.228	1.000
L	990	0.192	0.063	0.000	0.000	1.000
L	995	0.345	0.230	0.548	0.179	1.000
L	996	0.311	0.244	0.347	0.161	1.000
L	997	0.279	0.209	0.121	0.000	1.000

Moderate Training Sector

M	111	0.375	0.000	0.418	0.255	1.000
M	112	0.405	0.335	0.561	0.257	1.000
M	113	0.552	0.345	0.484	0.110	1.000
M	114	0.276	0.337	0.498	0.259	1.000
M	115	0.000	0.000	0.545	0.253	1.000

SG	CEMPG	LRY25	LRY26	LRY27	LRY28	LRY29
M	205	0.000	0.304	0.000	0.238	1.000
M	206	0.523	0.166	0.345	0.083	1.000
M	209	0.763	0.000	0.000	0.227	1.000
M	222	0.215	0.000	0.000	0.000	1.000
M	231	0.598	0.092	0.167	0.028	1.000
M	241	0.226	0.319	0.786	0.242	1.000
M	251	0.343	0.357	0.497	0.240	1.000
M	272	0.437	0.336	0.432	0.228	1.000
M	275	0.218	0.307	0.268	0.000	1.000
M	291	0.398	0.281	0.585	0.182	1.000
M	391	0.562	0.386	0.542	0.247	1.000
M	392	0.472	0.334	0.285	0.247	1.000
M	404	0.030	0.000	0.037	0.000	1.000
M	427	0.483	0.193	0.323	0.078	1.000
M	432	0.516	0.324	0.404	0.107	1.000
M	445	0.000	0.178	0.000	0.000	1.000
M	461	0.383	0.359	0.593	0.269	1.000
M	463	0.348	0.000	0.797	0.254	1.000
M	542	0.434	0.074	0.213	0.033	1.000
M	545	0.355	0.098	0.171	0.000	1.000
M	553	0.774	0.323	0.342	0.000	1.000
M	821	0.566	0.291	0.405	0.222	1.000
M	903	0.000	0.000	0.179	0.000	1.000
M	907	0.349	0.311	0.769	0.235	1.000
M	908	0.487	0.311	0.521	0.235	1.000
M	913	0.036	0.000	0.038	0.000	1.000
M	918	0.000	0.000	0.766	0.000	1.000
M	924	0.515	0.104	0.031	0.000	1.000

High Training Sector

H	202	0.471	0.321	0.297	0.230	1.000
H	203	0.214	0.343	0.521	0.238	1.000
H	207	0.538	0.125	0.000	0.094	1.000
H	208	0.102	0.096	0.403	0.110	1.000
H	273	0.000	0.000	0.000	0.231	1.000
H	301	0.432	0.238	0.346	0.069	1.000
H	307	0.305	0.324	0.269	0.232	1.000
H	316	0.083	0.152	0.262	0.090	1.000
H	324	0.351	0.309	0.556	0.231	1.000
H	329	0.425	0.151	0.228	0.068	1.000
H	341	0.081	0.044	0.351	0.032	1.000
H	362	0.498	0.066	0.122	0.050	1.000
H	443	0.147	0.008	0.000	0.000	1.000
H	464	0.240	0.350	0.333	0.254	1.000
H	919	0.000	0.000	0.000	0.000	1.000
H	982	0.480	0.301	0.000	0.000	1.000
H	991	0.192	0.240	0.260	0.198	1.000

EXTENSION RATES

SG	Sector group
CEMPG	Chief enlisted manager progression group
EF4Y3	Extension rate: first term, 4-year TOE, YOS = 3
EF4Y4	Extension rate: first term, 4-year TOE, YOS = 4
EF6Y5	Extension rate: first term, 6-year TOE, YOS = 5
EF6Y6	Extension rate: first term, 6-year TOE, YOS = 6
ESY1	Extension rate: second term, YETS = 1
ESY0	Extension rate: second term, YETS = 0
ECY1	Extension rate: career terms, YETS = 1
ECY0	Extension rate: career terms, YETS = 0

SG	CEMPG	EF4Y3	EF4Y4	EF6Y5	EF6Y6	ESY1	ESY0	ECY1	ECY0
Sector Averages									
S	.	0.531	0.514	0.498	0.112	0.358	0.526	0.189	0.650
L	.	0.491	0.551	0.515	0.434	0.385	0.672	0.185	0.696
M	.	0.557	0.572	0.506	0.386	0.374	0.531	0.194	0.617
H	.	0.585	0.627	0.558	0.275	0.474	0.532	0.180	0.635

Support Sector

S	472	0.489	0.620	0.388	0.000	0.364	0.538	0.178	0.694
S	602	0.564	0.535	0.563	0.000	0.370	0.364	0.214	0.614
S	603	0.637	0.486	0.637	0.486	0.293	0.364	0.185	0.612
S	605	0.636	0.560	0.323	0.000	0.335	0.364	0.180	0.613
S	611	0.559	0.581	0.559	0.000	0.382	0.633	0.211	0.693
S	612	0.558	0.581	0.558	0.000	0.381	0.633	0.211	0.684
S	622	0.494	0.535	0.494	0.535	0.304	0.655	0.204	0.622
S	645	0.439	0.460	0.434	0.000	0.324	0.639	0.187	0.616
S	651	0.583	0.457	0.000	0.457	0.294	0.523	0.181	0.696
S	661	0.522	0.485	0.522	0.485	0.470	0.470	0.189	0.694
S	672	0.509	0.547	0.505	0.000	0.428	0.475	0.192	0.552
S	673	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
S	691	0.564	0.494	0.564	0.494	0.178	0.430	0.171	0.700
S	701	0.561	0.480	0.000	0.000	0.328	0.445	0.184	0.667
S	702	0.561	0.489	0.561	0.085	0.327	0.449	0.186	0.666
S	703	0.561	0.480	0.561	0.000	0.335	0.445	0.207	0.667
S	705	0.561	0.444	0.561	0.000	0.331	0.445	0.188	0.667
S	732	0.565	0.492	0.544	0.052	0.422	0.529	0.186	0.665
S	733	0.580	0.457	0.580	0.457	0.431	0.545	0.210	0.673
S	734	0.580	0.463	0.580	0.309	0.432	0.545	0.213	0.670
S	741	0.571	0.504	0.571	0.000	0.338	0.518	0.200	0.700
S	742	0.573	0.504	0.573	0.000	0.337	0.518	0.211	0.700
S	753	0.577	0.462	0.577	0.000	0.446	0.493	0.217	0.951

SG	CEMPG	EF4Y3	EF4Y4	EF6Y5	EF6Y6	ESY1	ESY0	ECY1	ECY0
S	791	0.585	0.515	0.512	0.150	0.417	0.553	0.198	0.695
S	902	0.544	0.540	0.543	0.000	0.413	0.580	0.187	0.660
S	905	0.577	0.580	0.577	0.000	0.385	0.595	0.173	0.670
S	906	0.336	0.562	0.336	0.562	0.332	0.595	0.211	0.669
S	912	0.575	0.000	0.575	0.000	0.329	0.000	0.158	0.605
S	914	0.575	0.294	0.366	0.000	0.321	0.365	0.195	0.371
S	915	0.573	0.616	0.000	0.000	0.329	0.687	0.159	0.605
S	926	0.558	0.593	0.000	0.000	0.399	0.667	0.150	0.708
S	981	0.606	0.673	0.606	0.000	0.473	0.697	0.167	0.711

Low Training Sector

L	100	0.000	0.000	0.000	0.000	0.425	0.000	0.227	0.708
L	116	0.593	0.606	0.593	0.606	0.304	0.554	0.182	0.836
L	121	0.581	0.622	0.581	0.000	0.391	0.000	0.174	0.710
L	122	0.580	0.622	0.580	0.000	0.377	0.653	0.178	0.710
L	242	0.548	0.564	0.548	0.000	0.357	0.613	0.190	0.691
L	271	0.559	0.602	0.560	0.000	0.481	0.692	0.189	0.671
L	274	0.582	0.602	0.582	0.000	0.470	0.692	0.181	0.673
L	276	0.540	0.633	0.540	0.000	0.421	0.692	0.188	0.675
L	277	0.582	0.611	0.582	0.000	0.457	0.692	0.127	0.000
L	296	0.571	0.518	0.000	0.000	0.367	0.685	0.185	0.822
L	297	0.000	0.000	0.571	0.000	0.000	0.000	0.210	0.822
L	462	0.513	0.570	0.513	0.570	0.413	0.587	0.167	0.614
L	511	0.552	0.631	0.552	0.631	0.428	0.702	0.175	0.768
L	551	0.455	0.643	0.448	0.000	0.315	0.538	0.189	0.667
L	552	0.493	0.648	0.432	0.000	0.299	0.538	0.192	0.637
L	554	0.572	0.643	0.572	0.643	0.306	0.538	0.209	0.677
L	555	0.572	0.616	0.572	0.000	0.313	0.538	0.195	0.677
L	566	0.581	0.601	0.581	0.000	0.300	0.649	0.171	0.677
L	571	0.546	0.634	0.546	0.634	0.394	0.669	0.206	0.553
L	591	0.236	0.548	0.526	0.000	0.361	0.000	0.183	0.000
L	631	0.525	0.573	0.525	0.000	0.328	0.706	0.196	0.768
L	811	0.534	0.593	0.529	0.523	0.373	0.696	0.182	0.702
L	871	0.579	0.602	0.579	0.000	0.282	0.701	0.175	0.650
L	872	0.579	0.000	0.000	0.000	0.268	0.000	0.205	0.693
L	911	0.575	0.616	0.000	0.000	0.337	0.000	0.180	0.605
L	990	0.075	0.045	0.220	0.021	0.395	0.905	0.161	0.802
L	995	0.577	0.348	0.356	0.215	0.390	0.989	0.187	0.791
L	996	0.575	0.350	0.241	0.000	0.393	0.865	0.198	0.696
L	997	0.580	0.350	0.000	0.000	0.406	0.000	0.176	0.811

Moderate Training Sector

M	111	0.593	0.606	0.593	0.000	0.287	0.554	0.235	0.836
M	112	0.593	0.606	0.000	0.000	0.292	0.554	0.182	0.836
M	113	0.593	0.615	0.237	0.000	0.300	0.554	0.194	0.834
M	114	0.571	0.604	0.000	0.604	0.289	0.554	0.199	0.836
M	115	0.593	0.606	0.593	0.606	0.301	0.554	0.229	0.836

SG	CEMPG	EF4Y3	EF4Y4	EF6Y5	EF6Y6	ESY1	ESY0	ECY1	ECY0
M	205	0.596	0.655	0.596	0.655	0.485	0.575	0.171	0.681
M	206	0.592	0.656	0.469	0.136	0.476	0.497	0.200	0.670
M	209	0.593	0.656	0.593	0.000	0.471	0.000	0.252	0.681
M	222	0.590	0.556	0.000	0.000	0.379	0.000	0.180	0.705
M	231	0.572	0.626	0.538	0.252	0.403	0.674	0.192	0.720
M	241	0.548	0.564	0.000	0.000	0.348	0.613	0.190	0.691
M	251	0.482	0.618	0.482	0.618	0.472	0.685	0.177	0.706
M	272	0.596	0.607	0.596	0.607	0.485	0.692	0.180	0.673
M	275	0.591	0.611	0.591	0.611	0.484	0.692	0.205	0.673
M	291	0.475	0.520	0.466	0.469	0.375	0.746	0.188	0.803
M	391	0.587	0.470	0.000	0.000	0.350	0.532	0.186	0.789
M	392	0.587	0.496	0.587	0.000	0.359	0.532	0.198	0.809
M	404	0.595	0.550	0.595	0.000	0.537	0.505	0.199	0.625
M	427	0.561	0.578	0.482	0.216	0.348	0.573	0.185	0.517
M	432	0.576	0.554	0.523	0.274	0.356	0.476	0.201	0.561
M	445	0.511	0.411	0.362	0.000	0.643	0.000	0.146	0.315
M	461	0.486	0.543	0.486	0.543	0.362	0.570	0.176	0.532
M	463	0.691	0.557	0.691	0.557	0.318	0.570	0.231	0.635
M	542	0.545	0.703	0.532	0.549	0.410	0.568	0.185	0.599
M	545	0.493	0.703	0.482	0.446	0.388	0.568	0.175	0.597
M	553	0.606	0.643	0.606	0.643	0.320	0.538	0.179	0.677
M	821	0.599	0.550	0.599	0.000	0.693	0.527	0.192	0.697
M	903	0.423	0.580	0.421	0.000	0.410	0.595	0.150	0.663
M	907	0.572	0.580	0.572	0.000	0.387	0.595	0.183	0.670
M	908	0.569	0.580	0.000	0.000	0.396	0.595	0.228	0.670
M	913	0.575	0.479	0.000	0.000	0.329	0.561	0.247	0.464
M	918	0.575	0.616	0.575	0.000	0.328	0.687	0.164	0.605
M	924	0.584	0.568	0.579	0.548	0.395	0.655	0.183	0.653

High Training Sector

H	202	0.572	0.656	0.572	0.000	0.523	0.575	0.161	0.681
H	203	0.000	0.656	0.000	0.000	0.445	0.000	0.224	0.000
H	207	0.472	0.656	0.472	0.180	0.488	0.575	0.187	0.678
H	208	0.592	0.656	0.591	0.163	0.487	0.216	0.173	0.586
H	273	0.582	0.611	0.582	0.000	0.463	0.692	0.235	0.673
H	301	0.587	0.682	0.587	0.465	0.541	0.771	0.179	0.662
H	307	0.578	0.659	0.578	0.659	0.542	0.793	0.176	0.644
H	316	0.588	0.481	0.181	0.212	0.327	0.532	0.181	0.803
H	324	0.683	0.633	0.683	0.000	0.427	0.676	0.169	0.718
H	329	0.600	0.631	0.549	0.352	0.438	0.346	0.188	0.622
H	341	0.604	0.532	0.602	0.522	0.473	0.507	0.150	0.647
H	362	0.544	0.485	0.523	0.000	0.417	0.503	0.183	0.507
H	443	0.484	0.475	0.000	0.000	0.635	0.424	0.161	0.536
H	464	0.579	0.557	0.579	0.000	0.298	0.570	0.165	0.635
H	919	0.575	0.000	0.000	0.000	0.343	0.000	0.224	0.000
H	982	0.583	0.673	0.000	0.000	0.482	0.697	0.148	0.711
H	991	0.462	0.186	0.000	0.000	0.381	0.398	0.170	0.206

CAREERS-PROGRAM COEFFICIENTS

SG Sector group
CEMPG Chief enlisted manager group
CFGP Career field group
SK = skilled technician;
EM = electro-mechanical repair;
CR = crafts, service, and supply;
FS = functional support and administration;
OT = other
STAYSC Fraction of reenlistments that stay in same specialty
CCONxx Percent of movers (reenlistments that do not stay)
from career field xx that move to given specialty

SG	CEMPG	CFGP	STAYSC	CCONSK	CCONEM	CCONCR	CCONFS	CCONOT
----	-------	------	--------	--------	--------	--------	--------	--------

Sector Averages

S	.	.	0.7903	29.385	23.188	34.686	46.169	26.786
L	.	.	0.7017	14.630	14.045	26.426	14.037	18.217
M	.	.	0.7415	24.736	43.714	27.133	25.314	30.747
H	.	.	0.6996	31.246	19.053	11.723	14.455	24.230

Support Sector

S	472	EM	0.8676	0.726	4.849	2.069	2.175	3.160
S	602	FS	0.7714	0.150	0.221	0.690	0.135	1.185
S	603	FS	0.7136	0.202	0.037	1.149	0.361	3.160
S	605	FS	0.7817	0.202	0.037	0.230	0.180	0.395
S	611	CR	0.5370	0.202	0.883	1.379	1.985	0.395
S	612	CR	0.7525	0.100	0.074	3.677	0.541	0.790
S	622	CR	0.6958	0.050	0.037	0.230	0.045	0.395
S	645	FS	0.8072	1.484	1.199	1.975	9.961	1.580
S	651	FS	0.7448	0.543	0.396	0.407	4.594	0.395
S	661	FS	0.7525	0.050	0.294	0.230	0.902	1.580
S	672	FS	0.7669	1.613	0.736	1.838	4.150	0.790
S	673	FS	0.7525	0.000	0.000	0.000	0.000	0.000
S	691	FS	0.8060	0.457	0.400	0.104	0.921	0.716
S	701	FS	0.6974	0.050	0.147	0.460	0.045	0.395
S	702	FS	0.8072	0.000	0.000	0.000	0.000	0.000
S	703	FS	0.6930	0.050	0.147	0.230	0.045	0.395
S	705	FS	0.7455	0.807	0.037	0.057	2.165	0.395
S	732	FS	0.8088	7.713	6.405	8.963	11.005	3.555
S	733	FS	0.8960	0.807	1.325	0.689	1.444	0.395
S	734	FS	0.7525	1.260	0.441	1.379	0.767	0.790
S	741	FS	0.7964	1.008	0.736	1.379	0.722	0.395
S	742	FS	0.8465	0.605	0.589	1.149	0.361	0.395
S	753	FS	0.7426	0.605	0.589	2.528	0.180	1.580
S	791	FS	0.7159	2.288	0.334	1.006	1.592	1.185
S	902	SK	0.8134	7.556	2.355	2.467	0.992	1.185

SG	CEMPG CFGP	STAYSC	CCONSK	CCONEM	CCONCR	CCONFS	CCONOT
S	905 SK	0.8455	0.000	0.000	0.000	0.000	0.000
S	906 SK	0.8406	0.202	0.147	0.057	0.361	0.395
S	912 SK	0.7937	0.000	0.000	0.000	0.000	0.000
S	914 SK	0.7681	0.050	0.294	0.057	0.180	0.395
S	915 SK	0.8036	0.202	0.037	0.230	0.180	0.395
S	926 SK	0.7525	0.000	0.000	0.000	0.000	0.000
S	981 SK	0.7740	0.403	0.442	0.057	0.180	0.395

Low Training Sector

L	100 SK	0.7525	0.000	0.000	0.000	0.000	0.000
L	116 EM	0.8119	2.228	0.037	0.057	0.045	0.395
L	121 SK	0.7391	0.050	0.037	0.057	0.180	0.395
L	122 SK	0.7374	0.050	0.147	0.460	0.361	0.395
L	242 CR	0.8880	0.807	0.147	0.057	0.812	1.580
L	271 SK	0.6871	3.025	0.588	0.460	2.165	0.790
L	274 SK	0.6771	1.977	0.855	2.272	2.457	1.633
L	276 SK	0.6798	1.322	0.300	0.468	0.074	0.356
L	277 SK	0.7525	0.285	0.147	0.113	0.144	0.033
L	296 SK	0.7525	0.202	0.037	0.057	0.045	0.395
L	297 SK	0.7525	0.000	0.000	0.000	0.000	0.000
L	462 EM	0.6198	0.202	2.797	0.057	0.045	0.395
L	511 CR	0.7525	0.000	0.000	0.000	0.000	0.000
L	551 CR	0.8498	0.252	0.626	0.919	0.406	3.555
L	552 CR	0.8369	1.412	4.013	3.274	1.172	1.975
L	554 CR	0.8419	0.746	0.260	0.309	0.986	0.395
L	555 CR	0.8055	0.050	1.031	1.838	0.045	0.395
L	566 CR	0.8183	0.100	0.331	0.517	0.225	0.790
L	571 SK	0.8466	0.403	0.589	0.689	0.902	0.395
L	591 EM	0.7600	0.100	0.294	0.690	0.090	0.790
L	631 CR	0.6897	0.202	0.037	0.230	0.045	0.395
L	811 CR	0.6297	0.857	1.252	13.385	3.654	2.370
L	871 CR	0.7525	0.000	0.000	0.000	0.000	0.000
L	872 CR	0.8524	0.050	0.037	0.460	0.045	0.395
L	911 SK	0.8121	0.310	0.483	0.057	0.139	0.395
L	990 OT	0.7525	0.000	0.000	0.000	0.000	0.000
L	995 OT	0.7525	0.000	0.000	0.000	0.000	0.000
L	996 OT	0.7525	0.000	0.000	0.000	0.000	0.000
L	997 OT	0.7525	0.000	0.000	0.000	0.000	0.000

Moderate Training Sector

M	111 EM	0.7891	0.183	1.000	0.312	0.045	0.395
M	112 EM	0.8038	0.913	1.703	0.729	0.817	0.395
M	113 EM	0.7525	0.429	8.187	0.114	0.488	1.608
M	114 EM	0.7984	0.716	2.455	2.779	2.929	0.716
M	115 EM	0.7975	0.327	0.037	0.104	0.163	0.395
M	205 SK	0.6416	0.202	0.037	0.057	0.045	0.395
M	206 SK	0.6334	1.156	1.186	1.469	1.697	1.722

SG	CEMPG CFGP	STAYSC	CCONSK	CCONEM	CCONCR	CCONFS	CCONOT
M	209 SK	0.6276	0.155	0.037	0.057	0.045	0.395
M	222 SK	0.7525	0.310	0.147	0.271	0.106	0.395
M	231 SK	0.5807	1.865	2.391	1.437	3.067	1.975
M	241 CR	0.8651	0.734	1.270	1.719	1.453	0.395
M	251 SK	0.8336	1.239	0.423	0.928	1.320	0.932
M	272 SK	0.6734	3.507	2.509	1.359	0.942	0.395
M	275 SK	0.6825	0.807	0.147	0.176	0.361	0.395
M	291 SK	0.7525	0.000	0.000	0.000	0.000	0.000
M	391 EM	0.7456	0.238	0.037	0.136	0.277	0.395
M	392 EM	0.8252	0.605	2.242	0.057	0.180	1.580
M	404 EM	0.7650	0.252	0.260	0.352	0.732	0.790
M	427 EM	0.7431	1.073	4.051	1.386	1.599	2.793
M	432 EM	0.7156	1.665	7.872	2.540	1.990	5.530
M	445 EM	0.7525	0.000	0.000	0.000	0.000	0.000
M	461 EM	0.7945	0.050	0.258	0.057	0.045	0.395
M	463 EM	0.6766	0.119	0.629	0.475	0.163	0.395
M	542 EM	0.8071	0.454	1.325	2.125	1.489	1.185
M	545 EM	0.8023	1.057	1.588	1.903	1.494	1.580
M	553 CR	0.8265	0.734	1.524	0.661	0.657	1.213
M	821 FS	0.7525	1.613	0.294	3.677	1.083	0.395
M	903 SK	0.8441	0.152	0.090	0.098	0.232	0.407
M	907 SK	0.8565	0.807	0.589	1.149	0.722	0.395
M	908 SK	0.8509	0.202	0.442	0.689	0.180	0.395
M	913 SK	0.7825	0.360	0.150	0.114	0.319	1.975
M	918 SK	0.7525	1.983	0.681	0.057	0.381	0.395
M	924 SK	0.9519	0.829	0.153	0.146	0.293	0.421

High Training Sector

H	202 SK	0.6381	0.543	0.037	0.057	0.045	0.395
H	203 SK	0.7525	0.012	0.035	0.014	0.043	0.095
H	207 SK	0.6414	0.000	0.000	0.000	0.000	0.000
H	208 SK	0.7525	1.429	0.540	0.479	0.527	1.273
H	273 SK	0.6734	0.619	0.051	0.689	0.180	0.395
H	301 SK	0.6974	12.125	9.723	4.179	5.758	5.909
H	307 SK	0.6993	0.050	0.628	0.176	0.496	0.395
H	316 SK	0.6986	0.353	0.113	0.057	0.180	0.395
H	324 SK	0.6622	3.637	1.275	0.880	0.717	0.395
H	329 SK	0.6793	9.720	2.182	1.888	2.269	11.028
H	341 FS	0.7344	0.607	0.958	0.171	1.511	1.185
H	362 EM	0.8100	1.377	2.782	2.074	2.143	1.580
H	443 EM	0.7525	0.000	0.000	0.000	0.000	0.000
H	464 EM	0.6802	0.119	0.434	0.542	0.045	0.395
H	919 SK	0.7773	0.050	0.037	0.057	0.180	0.395
H	982 SK	0.7904	0.605	0.258	0.460	0.361	0.395
H	991 OT	0.7525	0.000	0.000	0.000	0.000	0.000

Appendix B

MENUS AND MACROS THAT RUN ALEC

The ALEC model is designed to be easy to use. Control programs, called "macros" in the jargon of spreadsheet programs, streamline much of the usual work necessary to operate a spreadsheet model.

Macros are nothing more than a collection of keystrokes that one would use to operate the spreadsheet if there were no macros. Those keystrokes take the form of pushing function keys to bring up the menus that are built into the spreadsheet software, and then typing the intital letters of the prompts on those menus.

This appendix gives each macro a title that explains its function. Then a listing of the macro defines it. The listing, however, does not explain how the macro works. Users of ALEC who want to understand the macros should type in each step of the macro by hand, reading the full text of the Symphony menu prompts along the way.

The macros are located at and below locations I1 and X1 on the ALEC spreadsheet.

MENU DISPLAYED AFTER ALEC'S AUTOMATIC START

START	{MenuBranch AA7}~	
	Yes	No
	Do you want to start?	Start?
	{Goto}A21~	{Services}
	{Goto}F34	E

MACRO TO MAKE AUTOMATIC START

name	command	comment
auto	{Home}~ {START}~	display title screen turn on START menu

MACRO TO ENTER SECTOR DATA

Alt-c {Menu}
C
F34~
J46~
{Menu}
C
F34~
AW169~
{Menu}
E
AT161.at180~
{Goto}at161~
{Services}
F
C
C
N
SectorH
~
I
V
ALECDATA~
{Goto}a61~
{Goto}g65~

MACRO TO DO COMPLETE ANALYSIS (REFERENCE CASE AND PLAN)

alt-p {REFCALC}
{REFCOPY}
{ANALYSIS}

MACRO TO JUST ANALYZE PLAN, GIVEN THAT REFERENCE CASE HAS
ALREADY BEEN ESTABLISHED BY DOING AT LEAST ONE COMPLETE ANALYSIS
FOR A SPECIFIC PART OF THE FORCE AND A SPECIFIC REFERENCE SITUATION

alt-k {ANALYSIS}

MACRO TO REANALYZE THE SAME CEMPG

alt-n {Goto}A61~
{Goto}g74~

MACRO TO START OVER

alt-s {auto}

MACRO TO RUN MODEL FOR REFERENCE CASE

name	command
refcalc	{Goto}A121~ {Menu} R V F65.F78~ AT8~ {Menu} R V F85.F95~ AT27~ {calc}

MACRO TO COPY REFERENCE CASE TO OUTPUT AREA

name	command
refcopy	{Menu} R V FR10.FR51~ FQ10~

MACRO TO ANALYZE THE PLAN

name	command
analysis	{Goto}A121~ {Menu} R V G65.G78~ AT8~ {Menu} R V G85.G95~ AT27~ {calc} {Goto}A141~

MACRO TO PRINT REPORT

name	command
alt-r	{Services} P S N U REPORT~ Q A G P Q {Goto}A141~

Appendix C

SYMPHONY TECHNIQUES USED TO BUILD ALEC

Symphony, Release 1.1, is a spreadsheet program made by Lotus Development Corporation, Cambridge, Massachusetts. A useful and recommended book for learning how to operate Symphony is Douglas Cobb, *Mastering Symphony*, SYBEX Inc., Berkeley, California, 1984. Page references in this appendix are to Cobb's book.

The notes in this appendix were made during the construction of the ALEC model, although not all the techniques discussed were used in the final version of the model. They are included with ALEC's documentation because they may help ALEC's users to modify the model or to expand the model's output. ALEC's basic lifecycle accounting structure is capable of answering more questions than the ones on which the model currently concentrates. Only a small amount of revision or expansion may be necessary to considerably increase the model's utility to some users.

The notes are organized by the following model-building jobs:

- Autoexec macros,
- Menu macros,
- Automatic input screen (method 1),
- Automatic input screen (method 2),
- Highlighting and protection,
- Making a bar graph,
- Making a window for a graph,
- Using the wordprocessor to make a report,
- Printing a report with a macro,
- Notes for special report formats.

AUTOEXEC MACROS

To get the program to do something automatically when it is retrieved, use the "autoexec macro" (p. 711). Build a start-up macro, and give it the name "auto." Any name will do. Then do the following when constructing the program.

action	comment
<Services>	
S	Settings
A	Auto-execute
S	Set
auto	name given to autoexec macro
<return>	
Q	Quit

A typical start-up macro will send the computer to the title screen and display an initial menu, for example:

name	commands	comments
auto	Autoexec macro	explanation of macro
	{home}~	initial cell of macro
	{START}~	Menu macro

Remember to assign a range name to the initial cell of the macro. Place the cursor on the first cell of the macro (the one with {home}~ in the example), and then do the following:

action	comment
{menu}	
R	Range
N	Name
C	Create
auto	type in name of macro
<return>	press <return> to enter the macro name
<return>	press <return> to record the cell address

The start-up menu (and any menu) is built as follows:

MENU MACROS

Step 1: Dedicate a spreadsheet region two screens wide (and all the way down) to menu macros.

Step 2: Set the widths of the columns successively to 9,9,45,18,18,18, and 18. There is nothing necessary about these particular choices; however, they seem to leave enough room for reasonably complete prompts and still make the menu macro fit on two screens.

To change the width of a column of cells from the default width of 9, do the following:

action	comment
<menu>	
W	Width
S	Set
45 <return>	number of spaces in column, <return>

The special spacing is needed to allow questions and prompts to have more than the standard 9-character length.

Step 3: Type the macro name in the first column. (Use all capitals as a device to remember which macros are menu macros. The computer does not distinguish between capitals and lower case in macro names, but the "all capital" convention for naming macro menus makes the Symphony command language easier to understand.)

Step 4: Move one column to the right and type: {MenuBranch C3}~

The "C3" stands for the cell that is two columns over and two rows down from the cell containing the menu macro's name. In other words, these notes assume that the menu macro's name is in cell A1.

Step 5: Move cursor over one more column, and down two rows (that is, go to the cell named in MenuBranch).

Step 5a: Type first prompt: Yes
Step 5b: Move cursor down one row
Step 5c: Type prompt: Do you want to start?
Step 5d: Move cursor down one row
Step 5e: Type macro that does the job selected
(or branch to that macro)

Step 6: Repeat step 5 for successive columns to the left until all the desired menu choices have been constructed.

Example: the start-up menu

START {MenuBranch C3}~

Yes	No
Do you want to start?	Start~
{macro}~	{auto}~

AUTOMATIC INPUT SCREEN (METHOD 1)

This macro allows the user to type in a number in response to the prompt, press <return>, and have the number accepted. It also allows the user to simply press <return> and have the currently displayed number remain unchanged. (Pressing <return> puts an error message in the storage cell, and the formula then copies the existing number back on itself.)

{Goto}A21~	sends cursor to upper left corner of input screen
{Goto}F28~	sends cursor to input cell

{GetNumber "Please enter number: ",I28}~ asks user for number,
puts response in I28

Formula for input cell:

@IF(@ISERR(I28),F28,I28)	If I28=ERR (due to <return>)
	then F28=F28 (remains same)
	else F28=I28 (user entry)

The initial version of ALEC used this method of helping the user input policy choices. It had the advantage of an automatic exit from the input routine. However, when the input routine was tested, users wanted flexible access (with arrow keys) to the policy choice they wanted to change, and they did not want to be automatically exited from the input routine until they indicated they were satisfied with their plan.

This complaint led to the design of alternative methods of entering policy choices.

AUTOMATIC INPUT SCREEN (METHOD 2)

A second method of constructing an automatic input screen uses Symphony's "Form" feature (p. 507). The final result is that not only can users type in a number in response to the prompt, press <return>, and have the number accepted; or simply press <return> and have the currently displayed number remain unchanged; but they can also move up and down the set of input numbers using the arrow keys.

The price paid for the flexible access provided with the arrow keys, however, is that there is no automatic exit from the data input routine (as there was in method 1). An <Alt+e> escape macro can be used, with a prompt on the input form screen that says "When you are finished making policy choices and want to evaluate your plan, press <Alt+e>."

This second method for constructing an automatic input screen pleased users during trial runs, but it could not be used in the final version of ALEC because it used too much memory space.

To construct the input routine, do the following:

Step 1: Go to a screen on the left side of the spreadsheet (so the wordprocessor's editing capabilities can be used) and below the rest of the spreadsheet (so rows can be added and deleted without messing up the rest of the spreadsheet).

Step 2: Type short names of data entries (no more than 9 characters, no blank spaces), and put field format information after the names. For example:

```
Zone-A  :N:9
PS      :N:9
```

In this example the names are 8 characters long (including blanks), and the data are specified to be numbers in a field 9 spaces wide. The use of 9 spaces makes the data fit into the default cell widths of the Symphony spreadsheet.

The names need only be good enough to be recognizable when data are looked at on the spreadsheet while building the program. The names will be edited (below) into longer prompts for the screen display that users see.

Step 3: Generate a form window. Place the cursor on the top data entry name, and do the following:

action	comment
<Alt+Type>	get access to choice of Symphony modes
F	Form mode
<menu>	
S	Settings
N	Name
C	Create a name for the input form
POL	name used for policy input form
Q	Quit

<Menu>	
G	Generate the input form
<return>	
<return>	
POL	type in the name of the input form again
<return>	
<.>	mark start of data names
<arrow down>	trace out all data names
<return>	
Q	Quit
<Menu>	
S	Settings
O	One record
Y	Yes
Q	Quit

Step 4: Add blank rows above and below entry items.

action	comment
<Alt+Switch>	switch to SHEET window (from FORM window)
<down arrows>	get down to data entry lines, next block down from where the names were typed in
<menu>	
I	Insert
R	Rows
<arrow keys>	
<return>	

[Repeat the row insert procedure to add rows below the entry lines.]

Step 5: Edit the data entry screen.

action	comment
<Alt+Switch>	switch to FORM window
<menu>	
S	Settings
F	Form
E	Entry
[Use arrows to recognize the extra rows above and below the data names.]	
Q	Quit
Q	Quit
<Alt+Switch>	switch to SHEET window
[Move lines up or down (not sideways); add comment or title lines; edit lines to move them toward the center of the screen.]	
[Go down one more block of text and edit the prompt comments, over to the right of the block of text. These prompts will appear on the top of the screen when the form entry is run in the final program.]	

Step 6: Build automatic access to the form entry.

The macro command {Switch} activates the form entry, and the same command given again will switch the program back to the worksheet.

Step 7: Use the data inputs.

Find the data matrix in the blocks of information below the (now edited) entry names. Refer to the cell numbers of the data to use the data in the spreadsheet program.

HIGHLIGHTING AND PROTECTION

Highlighting can be used to emphasize titles and input numbers on which the user should concentrate. If protection is turned on, then only the highlighted cells can be changed.

Highlighting Cells that Will be Unprotected

{menu}

R	Range
P	Protect
A	Allow-changes

Turning on Protection of all Other Cells

{Services}

S	Settings
G	Global protection
Y	Yes, turn it on
Q	Quit

MAKING A BAR GRAPH

These notes show how to (a) construct a graph, (b) make a window with a customized shape and location in which the graph will be displayed, and (c) build a macro that automatically builds and gets rid of the graph.

When displaying one graphics window, all others that have room to "show through" will also be displayed. This means that those graphs will come on automatically when another graph is called.

Naming Conventions

When the graph is seen in its window, the graph name (up to 15 characters) will be displayed at the lower left of the window, and the window name (again, up to 15 characters) will be displayed at the lower right of the window. Appropriate choices of the graph and window names can be used to send a message (in some cases there will be no need for a graph title, saving screen space for a slightly larger graph display).

Before starting, work out a plan for names.

- Graph title (will be placed on top of graph, unless the labels on the bottom of the window make the title unnecessary)

- Macro name (will be used to call construction routine, if necessary)
- Graph name (will appear on lower left of displayed window)
- Window name (will appear on lower right of displayed window)

Worksheet Material for a Graph

Step 1: Put description of numbers in a column (or row)

Step 2: Put numbers in an adjacent column (or row)

Step 3: Put cursor on start of descriptions (optional, but it makes constructing the graph easier)

Accessing the Settings Sheet and Naming the Graph

{MENU}	get menu
G	Graph
{Right}{Return}	1st Settings
N	Name
C	Create
GRAPH NAME{Return}	type in name (15 characters)
N	Name
I	Initialize settings

Note: Be sure to create a new name before initializing the settings, otherwise the initialization will wipe out the settings for the previously constructed graph.

Pointing Out the Data to be Used

T	Type of graph
B	Bar graph
R	Range
X	Labels below bars on x-axis

Move the cursor to the start of the descriptions of the numbers, then press <.>, then use the arrow keys to outline all the descriptions; finally, press <return>.

A height of bars

Move the cursor to the start of the numbers, then press <.>, then use the arrow keys to outline all the descriptions; finally, press <return>.

Q	Quit
S	Switch to 2nd settings

Titles

T	Titles
Y	Y-axis title
VERTICAL TITLE{Return}	Type in name
Q	Quit

Fixed Y-Axis Range

Y	Y-axis details
T	Type
M	Manual
0{Return}	Lower limit, example 0
4{Return}	Upper limit, example 4
Q	Quit
Q	Quit

Preview and Escape

P	Preview
{Esc}	Escape
Q	Quit

MAKING A WINDOW FOR THE GRAPH

Constructing the Window

{Services}	
W	Window
C	Create
WINDOW NAME{Return}	Type in name (15 characters)
G	Type of window: graph
[Use arrows to define shape]	
{Return}	Fix choice of window shape
Q	Quit

Attaching the Graph to the Window

{menu}	Press [F10] from inside window menu
A	Attach
GRAPH NAME	
{Return}	
<F6>, repeated as necessary	Keep pressing this "window" key until the worksheet returns

OR, call the desired window

by [F9] Window, Use, Main (or any other window)

Macro for Calling the Graph Window

{Services}	
W	Window
U	Use
{Esc}	
WINDOW NAME{Return}	Name of graph window
{Goto}A21{Return}	Where to go on worksheet
[escape routine]	see below

Escape routine (append to macro that creates the graphics screen)

{Get I24}~	Macro waits for a key to be pressed, graph stays on screen during wait
{If I24="p"}{Branch macro1}~	IF pressed key was "p", THEN do macro1
{Branch macro2}~	ELSE (any other key!) do macro2

Notes: The "Get" command makes the computer pause and wait for a single key stroke. Then this escape routine branches on what that key stroke entered. The unconditional "else" branch means that any other key will send the computer in this direction. In particular, the <return> key will have this effect.

Make the special keys be the same as the initial letters in the menu that allows users to choose graphics screens. Make the unconditional exit go back to that menu.

Getting Rid of Borders

{Services}

W	Window
S	Settings
B	Border
N	None
Q	Quit
Q	Quit

Macro for Returning to the Worksheet

{Services}

W	Window
U	Use

{Esc}

MAIN{Return}	Name of worksheet window
{Goto}A21{Return}	Where to go on worksheet

USING THE WORDPROCESSOR TO MAKE A REPORT

Document must use the "A" column.

<Alt+menu> <D> gets the wordprocessor going

<Ctrl+b> starts bold print

<Ctrl+e> ends bold print

Pressing the <Ins> key toggles between "insert mode" and "overwrite mode"

To insert a blank line, press <return>

To delete a blank line, press <F3>, the Symphony wordprocessor erase key (the special wordprocessor keys are in red on the Symphony function key template).

Copying, moving, and erasing work is the same as for the worksheet, except that the copy command inserts things rather than overwriting.

<Alt + {Center}> centers a line

<Justify> justifies everything up to a hard return (fill command is the default, {menu} even gets actual justification)

Automatic wrap works until a "hard return," which is done with the return key.

{Menu} Search sets up search for a string of characters

Type string

Enter it

Forward, Backward, or Quit

{Menu} Replace sets up replacing a string

Type string to be replaced

Enter it

Type new string

Enter it

Once, Continue, Skip, All-remaining, Quit (see p. 461 in Cobb)

PRINTING A REPORT WITH A MACRO

Constructing a Settings Sheet for a Specific Report

{Services}

P	Print
S	Settings
N	Name

C Create a name for the report setting sheet
REPORT Type in the name
<return>
S Source
R Range
A282.H410
<return>
P Page
H Header
[type header]

Notes: the format for a header is

left adjusted phrase|centered phrase|right adjusted phrase

The "pipe," | , is used to specify the justification. The # sign will call out the page number.

Q Quit
Q Quit
Q Quit

Automatic Printing of the Report

First, make sure the paper is lined up properly. The cut bar should be just below the second guide hole above the start of the first page.

Then, have the program run the following macro

{Services}

P Print
S Settings
N Name of report desired (this recalls settings sheet)
U Use
REPORT~
Q Quit

A	Align
G	Go
P	Page advance
Q	Quit

NOTES FOR SPECIAL REPORT FORMATS

Compressed Printing

To get a lot on one page use compressed printing.

Set Init-String: \015\027\048 to get more lines on a page and more columns. Reset page length to 88. Make margins 32 and 150, for printing a one-screen column. Make the margins 4 and 150 for printing a one-and-a-fraction screen column.

\015 compresses the columns, will print 14 standard columns;
or 18 columns that have width=7 (instead of the standard 9)

\015\027\048 compresses lines as well. Will print 8 lines to the inch instead of only 6 lines to the inch. Reset page length from 66 to 88, because $(8/6)*66 = 88$.

The resetting of the margins to (32,150) makes a standard screen print in the center of the page.

Multiple Page Report

Repeated headers will help put pages back together again if they should become scattered.

Care must be taken to make page breaks happen at the right time, and to make the text split acceptable.

Roll paper up in printer about 5/8 of an inch (just below the second roller hole above the tear line)

Length = 66, but the page break occurs at line 56.

| centers header

|| left justifies header

right justified | center | left justified is the most complex header

calls out the page number in the header

END

DATE

FILMD

3-88

DTIC